APPENDIX "A"

PATENT APPLICATION

A COMPUTER WITH SWITCHABLE COMPONENTS

Inventors:

Kenneth Largman,
a citizen of the United States of America, residing at
2460 21st Avenue
San Francisco, California 94116

Anthony B. More,
a citizen of the United States of America, residing at
750 Warfield Avenue #504
Oakland, California 94610

Assignee:

Self Repairing Computers, Inc.,
a California Corporation,
2460 21st Avenue
San Francisco, California 94116

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FLEHR HOHBACH TEST ALBRITTON & HERBERT LLP
4 Embarcadero Center
Suite 3400
San Francisco, CA 94111-4187
(415) 781-1989

A COMPUTER WITH SWITCHABLE COMPONENTS

This invention relates to computers, computer repair and computer architecture. More particularly, the invention relates to a computer architecture and software that enables the computer to repair itself.

BENEFIT APPLICATIONS

This application claims the benefit of the following applications:

U.S. Provisional Patent Application No. 60/205,531, entitled, "Scalable, Diagnostic, Repair and Multi-Use System for Computing Hardware & Devices That Utilize Computer Hardware," filed May 19, 2000, naming Kenneth Largman and Anthony More as inventors, with Attorney Docket No. ZAP 2000-1 and commonly assigned to Self-Repairing Computers, Inc. of San Francisco, California; and

U.S. Provisional Patent Application No. 60/220,282, entitled, "Scalable, Diagnostic, Repair and Multi-Use System for Computing Hardware & Devices That Utilize Computer Hardware," filed July 24, 2000, naming Kenneth Largman and Anthony More as inventors, with Attorney Docket No. ZAP 2000-1A and commonly assigned to Self-Repairing Computers, Inc. of San Francisco, California.

U.S. Provisional Patent Applications Nos. 60/205,531 and 60/220,282 are incorporated by reference herein.

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BACKGROUND

Personal-computer manufacturers and sellers often offer via-telephone and on-site repair services. Yet purchasers — particularly home, home-office and small-office purchasers — readily complain that their service contract offers less service than they expected. For example, a computer seller may dispatch a technician only after the purchaser calls the help center, performs a number of tests under the direction of the help center, escalates the problem at the telephone help center and performs redundant or additional tests under the direction of a putatively more knowledgeable telephone-help staff. The purchaser may have to escalate the problem still further and perform additional redundant tests before a repair technician is dispatched.

Frequently, the help center directs the customer to cycle the power on the computer, to re-boot the computer, to detach and reattach peripherals in question and to re-install application and operating-system software. Each call to the help center and each level of escalation may require the purchaser to cycle, re-boot, detach and reattach.

Detaching and reattaching peripherals can be extremely inconvenient. USB devices, for example, typically attach at the back of a computer in a location difficult to reach. In any event, the non-digerati purchaser may fear disassembling his computer, worrying that he may damage the computer further.

Help centers even direct a customer to reformat the boot drive of the computer and re-install operating-system and application software. Re-formatting is an onerous task for several reasons. Firstly, the home, home-office and small-office user rarely reformats a drive in the normal operation of his computer and is unfamiliar with the process itself. Secondly, reformatting destroys all the data on the drive, and such a user understandably becomes anxious on finding out that he will lose all of his data. Thirdly, such a user may not retain the application or operating-

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system installation media, especially where the seller pre-installs the software. The user may have been unsure which media to keep, or intending to keep a particular media, is in fact unable to locate that media later when needed.

Fourthly, the user typically does not back up his drives as often as an information technologist would recommend. That he will have to rely on his back ups (if any) if he is to have any hope of restoring his application is then not a comforting thought.

Accordingly, the art evinces a need for a computer that reduces or even eliminates the need for a user to call a help line, to keep installation media, to attach and reattach peripherals at the port, etc. Indeed, a computer that reduces or eliminates the technical savvy its user needs to effect repairs is desirable.

These and other goals of the invention will be readily apparent to one of ordinary skill in the art on reading the background above and the description below.

BRIEF DESCRIPTION OF THE DRAWINGS

Figure 1 illustrates a computer incorporating an embodiment of the invention.

Figure 2 is a schematic of a data-store switch according to an embodiment of the invention.

Figures 3A through **3B** illustrate the switch-and-repair process according to one embodiment of the invention.

Figure 4 illustrates the flow of control in a data-store switch according to one embodiment of the invention.

Figure 5 illustrates a computer incorporating an embodiment of the invention.

Figures 6A, 6B illustrate a computer incorporating an embodiment of the invention. **Figure 6A** illustrates the enabling of a data

store in conjunction with the defeat of access to a communications link. **Figure 6B** illustrates the enabling of a data store in order to support access to the communications link.

Figures 7A, 7B illustrate a computer incorporating an embodiment of the invention. **Figure 7A** illustrates the computer in its Network Disconnected state, while **Figure 7B** illustrates the computer in its Network Connected state.

Figure 8 illustrates a computer incorporating an embodiment of the invention.

Figures 9A, 9B illustrate a computer incorporating embodiments of the invention.

Figure 10 illustrates a computer incorporating an embodiment of the invention.

(The drawings are not to scale.)

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SUMMARY

Herein are taught apparatus and methods for a computer to repair itself.

DESCRIPTION OF THE INVENTION

OVERVIEW

An example of the invention in use follows: A user runs an application on a computer incorporating an embodiment of the invention. At some point, the user modifies the application or underlying operating system to the point that the application, the operating system or both become unusable. Indeed, the user may no longer be able to even boot the operating system.

Recognizing that the computer needs to be repaired, the user throws a switch on the computer. The computer fixes the malfunctioning software and so informs the user.

The user can then re-boot the computer. On re-booting, the

user again has access to a correctly functioning operating system, application and data files.

A Self-repairing Computer

Figure 1 illustrates a computer **1** incorporating an embodiment of the invention. The computer **1** may include a CPU **10**, volatile memory **11**, peripheral controllers **17, 18**, a first non-volatile data store **12** and a bus **15**, all well known in the art.

The computer **1** may also include switches **13, 19**, a second non-volatile data store **14**, a controller **1A**, a power supply **1B**, an output device **1C** and an input device **1D**.

The bus **15** may communicatively couple the volatile memory **11** and the peripheral controllers **17, 18** to each other and to the CPU **10**. The peripheral controllers **17, 18** may communicatively couple with the data stores **12, 14**, respectively.

The switches **13, 19**, the controller **1A**, power supply **1B**, output device **1C** and input device **1D** may form a data-store switch **1Z**. A data-store switch may alter the accessibility of a connected data store according to the setting of the switch.

The controller **1A** may communicatively couple with the switches **13, 19**, the output device **1C** and the input device **1D**. The power supply **1B** may supply the controller **1A** (and other switch components) with power. More particularly, the power supply **1B** may power the controller **1A** independently of the power to the rest of the computer **1**.

The power to the switch **1Z** may come from the same source as the power for the rest of the computer (the wall outlet or laptop battery, for example). The switch **1Z** may then be powered from that supply even when the rest of the computer **1** is not. **Figure 10** illustrates this embodiment of the invention.

The switch **13** may communicate with the data store **12**. The switch may control (toggle, for example) the identification settings of the

data store **12**.

The switch **19** may couple to the data store **14**. The switch **19** may control (toggle, for example) the power to the data store **14**.

The volatile memory **11** may be random-access memory. The data stores **12, 14** may be magnetic disks, for example.

The output device **1C** may be the monitor of the computer **1**, LEDs or an LCD distinct from the monitor, for example.

Figure 2 is a schematic of the data-store switch **1Z** according to an embodiment of the invention. In **Figure 2**, the opto-isolators **U2, U3** implement the switches **13, 19**, respectively. The Basic Stamp II microcontroller **U1** (from Parallax, Inc., Rocklin, California) implements the controller **1A**. The battery **V3** implements the power supply **1B**. The LCD display port **J1** represents the output device **1C**, and the switches **S1, S2** implement the input device **1D**. (Opto-isolator **U4** detects whether the computer **1** has power.)

In a first mode of operation herein termed "normal mode," the computer **1** may run a predetermined operating system and application. Accordingly, the data store **12** may contain a correctly functioning copy of that software. The CPU **10** may access the data store **12**, boot the operating system and then execute that application.

The data store **12** is termed herein the "boot data store." The data store **12** may contain a bootable, executable operating system and executable application.

The data-store switch **1Z** may make the data store **12** accessible to the computer **1** as the boot drive (by means of the switch **13**, for example). The data-store switch **1Z** may also make the data store **14** inaccessible to the computer **1** (by means of the switch **19**, for example). Otherwise, the data-store switch **1Z** may idle, waiting for user input on the device **1D**.

In the normal stage, the computer **1** may perform as a conventional computer. The user may run his application software,

inattentive to the invention incorporated into the computer **1**.

In a third mode of operation herein termed the "repair mode," the CPU **10** may run software on the data store **14** and the controller **1A** may execute a program in parallel. A mode intermediate to the normal and repair modes, herein termed the "switching mode," may effect the transition from normal to repair mode.

In the switching mode, using an input device such as the device **1D** the user may indicate that he wishes to repair software on the data store **12**. (**Figures 3A** and **3B** illustrate the switch-and-repair process according to one embodiment of the invention.) In response to the input, the computer **1** may switch from normal operation to repair, step **310**, and repair the software on the data store **12**, step **320**.

The switching of a data store may be logical or physical. Logical switching is switching enforced purely by software. For example, software may set one or more predetermined bits that it or other software tests to determine whether a data store is accessible at any given time.

A physical switch opens or closes a predetermined electrical circuit of a device to be switched. A physical switch may, for example, alter the open/close state of identification jumpers of a data store. A physical switch may turn on or off the power supply to a device to be switched.

Figure 4 illustrates the flow of control in a data-store switch **1Z** according to one embodiment of the invention. On start up, the data-store switch **1Z** may go into normal mode of operation. In this stage, the switch **1Z** may set the switch **13** to make the data store **12** the boot drive, step **4A3**. The switch also may set the switch **19** to leave the template data store **14** unpowered.

The data-store switch **1Z** may then idle, waiting for the user to initiate the switch to repair mode, step **4A5**. The data-store switch **1Z** may display a message indicating that it is in normal mode, step **4A1**.

When the data-store switch **1Z** receives an indication to switch

to repair mode, the switch **1Z** may ask the user to confirm this indication, step **4B5**. Confirmation is preferable where the repair process is destructive before it is constructive. Confirmation is preferable also because the activation of the input device indicating the switch to repair mode may have been accidental or ill considered.

On confirmation if requested, the data-store switch **1Z** may switch power to the data store **14**, step **4B9**, making the data store **14** accessible to the computer **1**. The data store **14** may be permanently configured to be addressable as the boot drive when it is accessible. Accordingly, the address of the data store **12** may then change.

In normal operation, the data store **12** may be addressable as the boot drive. However, during the switch, the switch **1Z** may change the identity (address jumpers, for example) of the data store **12** to something other than the boot-drive identity.

The computer **1** is now ready to enter the repair stage.

Switched physically to repair mode, the computer **1** may boot from the template boot drive. The booted program or some other program executed during the boot sequence (autoexec.bat, for example, on machines running Windows™ operating system from Microsoft Corp., Redmond, WA) may query the user.

In one embodiment, on rebooting the computer **1** may automatically repair the data drive **12**. It copies software from the template data store **14** to the data store **12** without further direction from the user. Previously set user preferences may, however, direct the course of repair.

Thus, where the template data store **14** contains only application software, the repair process may copy over or re-install that application software from the template data store **12**. Where the template data store contains operating-system and application software, the repair process may copy over or re-install the operating system first and then the application software.

Uninstallation or deletion of an application may precede re-installation or copying over of that software. Re-formatting of the data store **12** may precede re-installation or copying over of the operating system. Resetting of ROM-resident parameters may precede re-installation or copying over of operating-system or application software.

On completion of the repair, the repair software may direct the user to switch back to normal mode and re-boot the computer **1**.

Alternatively, the repair process may be menu-driven. The repair process may present the user a sequence of options to determine what repair process to execute. For example, on re-boot in repair mode, the repair software may offer the choices of running the repair process, reviewing repair-process settings, updating the template software (the application, operating system or repair-process software itself) and quitting the repair process.

The template data store **14** may contain application software, operating-system software and repair-process software. The application software may include the executable software itself (.exe, .dll, .o, etc.) or the files created by the application (.wpd files for Corel WordPerfect word-processing software, for example).

The software on a template data store **14** typically is an operating system and may include one or more applications, along with the underlying software to run the operating system (and any included application) on a computer with a predetermined configuration. The underlying software may include one or more boot records, one or more partition tables or a BIOS.

The template software is created by installing software onto a data store, by copying installed software onto the data store or by copying installation software onto a data store. (Installed software includes data files and other pre-existing software.)

The template data store software may be updated. Where the template software is installation-ready software, that installation software

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may be updated to a different, usually later, version. Where the template software is a backup of the software on the data store **12**, a different, usually more recent, backup of the data-store software replaces or supplements that software.

Repair-process settings may include whether to recover data, run a virus check, reformat the data store, revert to a backup, run a human-mediated (i.e., manual) or an automatic repair, run diagnostics (software or hardware, for example). Repair-process settings may also include whether to format and at what level (quick versus low-level, for example), what software to re-install (operating system (OS) only; OS and executable-application software; OS, executable-application software and application data files; data files only, for example), whether to switch automatically (i.e., under program or hardware control), what level of repair to run (quick, better or best, in one embodiment), whence to setup (backup or template, in one embodiment) and whence to recover data files (most recent backup prior to repair, backup at the time of repair, other predetermined backup, query-and-response-specified backup, as examples).

The repair process may entail recovering a usable version of the appropriate data file. In some instances of computer repair, the problem is not so much with the operating-system or executable-application software so much as with the files (usually data files) associated with one or more of the applications. If the application in question is Microsoft Outlook, then the file to be recovered may be the mail-and-folder-data .pst file. Where the application is Microsoft's Internet Explorer, the file to recover may be the favorites file.

Running a virus check may entail first checking that the virus-check-and-repair software is up to date. Because new software attacks appear daily, and because newer malicious code has a higher chance of delivering a payload, this is not a trivial step. The software may then check for malicious code and repair software, as directed by the user or by

default.

The above process presupposes that the data store **14** contains a copy of (a version of) the operating-system, application software or data file on the data store **12**. In this sense, this second data store **14** is termed herein the "template data store." With the computer **1** switched to boot from the template data store **14**, the computer **1** may perform the original copying of template software onto the data store **14**. (Where the data store **14** is a read-only medium, it may arrive at the computer **1** in a pre-written state.)

An example of the operation of the computer **10** follows: Assume that the data store **12** contains a bootable Windows™ operating system (from Microsoft Corp., Redmond, WA). Assume also that the data store **12** also contains NaturallySpeaking® application software (Lernout & Hauspie, Ieper, Belgium and Burlington, MA).

The operating system and the application on the data store **12** may have each been run any number of times, and the user may have customized the operating system, the application or both to his preferences. In contrast, the template data store **14** may contain as-installed copies of the operating-system and the application software.

In the course of using his computer **1**, the user puts the computer **1** into an undesirable state. He may, for example, foul up the optional settings of the operating system or application such that he cannot reset them to a usable state. He may download a virus, trojan horse or other malicious code that changes his operating system, application or both. The particulars of the malicious code are unknown but the manifest effect is that the computer **1** is partially or completely inoperable. He may remove files critical to the correct operation of the software. As one of skill in the art will recognize, the ways in which software may be intentionally or unintentionally altered to the point of unusability are legion.

Recognizing that his computer **1** is in an undesirable state, the

user activates the switch **13**, step **300**. **Figure 3** illustrates the switch-and-repair process according to one embodiment of the invention, and step **310** illustrates the actual switching. In response to the switch activation, step **300**, the computer **1** repairs the software on the data store, step **320**.

The repair process involves copying software from the template data store **14** to the data store **14**. The software on the template data store **14** may be a master copy, a backup copy or an archive copy of software on the data store **12**. (An archive is a copy of software, which copy cannot be overwritten or deleted.)

With template software on the template data store **14**, the computer **1** may re-install or copy over software onto the data store **12**. The computer **1** may overwrite all or part of any software on the data store **12**.

The computer **1** may offer the user options as to how thorough its attempt to repair itself should be. In one embodiment, the computer **1** offers the options of a "Quick Repair," a "Better Repair," a "Best Repair" and a "Test." A Quick Repair may, for example, re-install or copy template software from the data store **14** onto the data store **12** without first re-formatting the data store **12**. The Better Repair may perform a high-level re-format of the data store **12** before that copy or re-installation. A Best Repair may perform a low-level re-format of the data store **12** before copying over or re-installing software.

Figure 4 illustrates the switch-and-repair process in more detail, according to one embodiment of the invention. The switching copies software from the template data store onto the data store, replacing the unusable software on the data store.

A number of situations occur where the computer **1** may effect repair without rebooting. For example, if only data files or application executables need to be repaired, then shutting down the operating system booted from the data store **12** is not usually necessary — especially in newer operating systems such as Windows 2000 (Microsoft) and more

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sophisticated operating systems such as Linux .

Further, a large number of operating-system files can be repaired (for example, by replacement) without shutting down the operating system. Repairing the operating system without rebooting is a preferred embodiment.

Still further, for backups (automated or otherwise), continuing to run from the data store already booted may be preferable. Where the computer **1** can become sufficiently quiescent that a backup from the data store **12** to the data store **14** can occur while still booted from the data store **12**, then such a backup is quicker than shutting down and backing up the data store **12** while booted from the data store **14.**

Where the data store **12** remains the boot drive when the data store **14** is simultaneously available, the data store **14** may be addressable as other than the boot drive. The address of the data store **14** may be switched similarly to the address switching of the data store **12.**

A VIRUS- AND HACKER-RESISTANT COMPUTER

Figure 6A illustrates a computer **6** incorporating an embodiment of the invention. The computer **6** may include a CPU **60**, volatile memory **61**, peripheral controllers **67, 68**, first and second non-volatile data stores **62, 64**, data port **69**, communications link **6A** and buses **65, 66**, all well known in the art. The computer **6** may also include a data-store switch **6Z.**

The bus **65** may communicatively couple the volatile memory **61**, the peripheral controllers **67, 68** and the data port **69** to each other and to the CPU **60**. The peripheral controllers **67, 68** may communicatively couple with the data stores **62, 64**, respectively. The data port **69** may mediate access to the communications link **6A.**

The bus **66** may communicatively and electrically couple the peripheral controller **67** to the data store **62** and to the boot-store switch **6Z.** More specifically, the boot-store switch **6Z** may switch the power line **661** of

the bus **66**, thus powering up or down the boot store **62**.

Likewise, the bus **67** may communicatively and electrically couple the peripheral controller **68** to the data store **64** and to the boot-store switch **6Z**. The boot-store switch **6Z** may switch the power line **671** of the bus **66**, powering up or down the boot store **64**.

The port **69** may link the computer **6** to other devices such as a modems, networks, etc. as indicated by the communications link **6A**.

The computer **6** may operate in two states: Connected and Disconnected. In the Disconnected state, the computer **6** does not use the data port **69** to communicate and the data-store switch may enable the data store **62**.

By contrast, in the Connected state, the computer **6** may use the data port **69** to obtain data over the communications link **6A**. In the Connected state, the switch may enable the second data store **64**.

Thus, the computer **6** may enable only one of the multiple data stores **62**, **64** at any given time, which depending on whether it is accessing the communications link **6A**. This isolates data received over the communications link **6A** to one of the data stores, namely, the data store **64**. Where the data received was maliciously created (a virus or a hacking executable), this data is confined to the data store **64**.

The switching of the data stores **62**, **64** may be done under manual, hardware or software control. A mechanical throw switched by the user when the user wishes to access (or cease accessing) the communications link exemplifies a manual switch. A boot-store switch **6Z** that responds programmatically to the CPU **60** illustrates a software-controlled switch.

For example, if the user boots an Internet browser and the communications link **6A** is the Internet, then the CPU **60** may programmatically recognize the (intended) launch of a browser and initiate the switch of the data stores **62**, **64**. The switch may involve re-booting the computer **6** in order to make the second data store **64** the only

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data store available during the use of the communications link **6A**. (A browser on the data store **64** may launch automatically on the boot from the data store **64**.)

In one embodiment, the computer may synchronously switch the port **69** and the second boot store **64**. This may improve the resistance of the computer **6** to hacking or infection.

Figure 6A illustrates the enabling of the data store **62** in conjunction with the defeat of access to the communications link **6A**. The solid line continuing the power line **661** through the boot-store switch **6Z** illustrates the accessibility of the data store **62**. Conversely, the dashed lined through the switch **6Z** illustrates the inaccessibility of the data store **64**.

Figure 6B illustrates the enabling of the data store **64** in order to support access to the communications link **6A**. The solid power line through the boot-store switch **6Z** illustrates the accessibility of the data store **64**. Conversely, the dashed lined through the switch **6Z** illustrates the inaccessibility of the data store **62**.

The data store **64** may contain application software to process the data received over the link **6A**. In such a setting the need to migrate the data on the data store **64** to the data store **62** may be minimal or non-existent.

Where, however, the application to process the data received over the link **6A** and stored on the store **64** resides on the data store **62**, then a process of migration is necessary. A predetermined time after receiving data over the link **6A**, the computer may simultaneously enable the data stores **62, 64** and copy the data received to the data store **62** for processing there. The delay allows, for example, anti-virus software providers to produce and distribute security software addressing threats that have come to light since the time of receipt of the data.

The migration process may be manual or automatic.

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A LOCKABLE NETWORK COMPUTER

Figure 7A illustrates a computer **7** incorporating an embodiment of the invention. The computer **7** may include a CPU **70**, volatile memory **71**, a peripheral controller **77**, a non-volatile data store **72**, a data port **79**, a communications link **7A** and buses **75, 77**, all well known in the art. The computer **7** may also include a switch **7Z**.

The bus **75** may communicatively couple the volatile memory **71**, the peripheral controller **77** and the data port **79** to each other and to the CPU **70**. The peripheral controller **77** may communicatively couple with the data store **72**. The data port **79** may mediate access to the communications link **7A**.

The bus **77** may communicatively or electrically couple the data port **79** to the communications device **7B**.

The port **79** may link the computer **7** to other communicators through a communication device **7B** and over a communications link **7A**. Examples of the communications device **7B** and link **7A** include an acoustic modem **7B** and a POTS telephone line **7A**; a tap **7B** and an ethernet **7A**; and a wireless modem **7B** and radiation-permeable space **7A**.

The switch **7Z** may switch a power line **771** of the bus **77**, thus powering up or down the communications device **7B**. The switch **7Z** may switch (tri-state, for example) a data line **771** of the bus **77**, thus interrupting or enabling the ability of the communications device **7B** to transfer data to the data port **79**.

The computer **7** may operate in two states: Network Connected and Network Disconnected. **Figure 7A** illustrates the computer **7** in its Network Disconnected state, while **Figure 7B** illustrates the computer **7** in its Network Connected state. (The solid line continuing the power line **761** through the switch **7Z** illustrates the continuity of the power or data line **771**, and dashed lined through the switch **7Z** illustrates the discontinuity of that line **771**.

In the Network Disconnected state, the switch **7Z** may disconnect the communications device **7B** from communicating on the data port **79**. Accordingly, none of the software running on the computer **7** may access the communications link **7A**.

By contrast, in the Network Connected state, the switch **7Z** may enable the communications device **7B** to communicate on the data port **79**. Accordingly, software on the computer **7** may access the communications link **7A**.

An exemplary use for the computer **7** is where a parent uses the computer **7** to access, say, his employer's computer network via a virtual private network (VPN) over the Internet **7A**. The parent also wants his child to be able to use the computer **7** for school or recreation — but without access to the Internet **7A**. The parent thus switches the computer **7** into the Network Enabled state when he (the parent) wants to use it, and switches the computer **7** into the Network Disconnected state when the child is to use the computer **7**.

The switching of the data stores **72, 74** may be done under manual, hardware or software control. A mechanical switch thrown by the user when the user wishes to access (or cease accessing) the communications link **7A** exemplifies a manual switch. A mechanical switch that may be locked with a key, for example, is preferable.

A switch **7Z** that responds programmatically to the CPU **70** illustrates a software-controlled switch **7Z**. (The CPU **70** may respond to any kind of input, including keystrokes, voice commands, biometric data and data received over a network.) A hardware switch **7Z** may be considered as an analog computer.

A computer **7** running an operating system that supports hot swapping offers an advantage. The addition and removal of the communications device **7B** from the computer **7** may confuse OSs that do not permit hot swapping of peripherals.

A MULTI-DATA STORE SERVER

Figure 8 illustrates a computer **8** incorporating an embodiment of the invention. The computer **8** may include a CPU **80**, volatile memory **81**, a peripheral controller **87**, multiple non-volatile data stores **82a, 82b, . . . 82α**, a data port **89**, a communications link **8A** and a bus **85**, all well known in the art. The computer **8** may also include a data-store switch **8Z** and a bus **86** consisting of the buses **861** or **862**.

The bus **85** may communicatively couple the volatile memory **81**, the peripheral controller **87** and the data port **89** to each other and to the CPU **80**. The data port **89** may mediate access to the communications link **8A**.

The peripheral controller **87** may communicatively couple with the data-store switch **8Z**. The data-store switch **8Z** in turn may communicatively or electrically couple to the data stores **82**. The bus **861** may communicatively couple the data path of the switch **8Z** to those of the data stores **82**, and the bus **862** may electrically couple a power supply in or through the switch **8Z** to the data stores **82**.

The data port **89** may mediate access to the communications link **6A**. The port **89** links the computer **8** to other communicators over the communications link **7A**.

The computer **8** may operate in any of N states, where N is the number of data stores **82**. In a first state, the data-store switch **8Z** enables the first data store **82a** to communicate with the peripheral controller **87**. In the second state, the switch **8Z** enables the second data store **82b** to communicate with the peripheral controller **87**, and in the Nth state, the switch **8Z** enables the Nth data store **82α** to communicate with the peripheral controller **87**.

The corruption or other failure of the data store **82** currently communicating with the controller **87** prompts the switching from one state to another, and thus from the failed data store to another, working data

store **82**. (The failed data store **82** may then be repaired in place, or it may be removed and repaired, removed and replaced, or removed permanently.)

Where, for example, the computer **9** is a web server and the communications link **8A** is the Internet, the multiple data stores **82** may provide resistance against infection and hacking by malicious users of the Internet **8A**. If the hackers succeed in corrupting the data store currently attached to the peripheral controller, then a switching may occur from that corrupted data store **82** to another correct data store **82**. This switching may occur very quickly (preferably as quickly as possible) in order to minimize the loss of access to the data on the data stores **82**.

The switching may be manual, hardware or programmatic. For example, a diagnosis program may execute periodically to determine the health of the currently accessible data store **82**.

20040960.0204

A COMPUTER WITH PERIPHERALS THAT CAN BE CYCLED

Figure 9A illustrates a computer **9** incorporating an embodiment of the invention. The computer **9** may include a CPU **90**, volatile memory **91**, a controllers **97, 98**, a non-volatile data store **92**, a port **99**, a peripheral **9B** and buses **95, 97**, all well known in the art. The computer **9** may also include a switch **9Z**.

The bus **95** may communicatively couple the volatile memory **91**, the controllers **97, 98** to each other and to the CPU **90**. The controller **97** may communicate with the data store **92**. The controller **98** may communicate with the peripheral **9B**.

The bus **97** may communicatively or electrically couple the port **99** (and thus the controller **98**) to the peripheral **9B**.

The peripheral **9B** may be any computer peripheral. Examples include printers, USB devices, scanners, fax machines, data stores and keyboards.

The switch **9Z** may switch a power line **971** of the bus **97**, thus

powering up or down the peripheral **9B**. The switch **9Z** may switch one or more data lines **972** of the bus **97**, thus disabling or enabling the peripheral **9B** to transfer data to the port **99**.

A user of the computer **9** may be using the peripheral **9B**, transmitting or receiving data on the from the device **9B** as expected. The switch **9Z** is supplying power to the peripheral **9B**.

At some point, the computer **9** becomes unable to communicate with the peripheral **9B**. This may be caused by an error in the software or hardware of the computer **9**, including software or logic of the peripheral **9B**.

The user attempts to revive communications with the peripheral **9B**. The user may. for example, cycle the power to the peripheral **9B**. Thus, the user changes the state of the switch **9Z** such that the switch **9Z** goes from powering to the peripheral **9B**, to not powering that peripheral **9B**, to again powering that peripheral **9B**. This switching may be done manually, in hardware, or programmatically.

The cycling of the peripheral **9B** may resolve the communication problem that the user was experiencing. For example, where the problem was with the software or logic of the peripheral **9B**, then the power cycling may clear the software or logic state of the peripheral **9B**. Where the problem was with the software or logic of the computer **1**, cycling the power may clear the software or logic state f the controller **97** or applications running in the memory **91**.

Figure 9B illustrates an alternate embodiment of the computer **9**. The switch **9Z** switches both power and data lines.

A Multi-user Computer

Figure 5 illustrates a computer **5** incorporating an embodiment of the invention. The computer **5** may include a CPU **50**, volatile memory **51**, a peripheral controller **57**, multiple non-volatile data stores **52a, 52b, . . . 52α** and a bus **55**, all well known in the art. The computer **5** may also

include a data-store switch **5Z** and a bus **56** consisting of the buses **561** or **562**.

The bus **55** may communicatively couple the volatile memory **51**, the peripheral controller **57** and the data port **59** to each other and to the CPU **50**.

The peripheral controller **57** may communicative with the data-store switch **5Z**. The data-store switch **5Z** in turn may communicatively or electrically couple with the data stores **52**. The bus **561** may communicatively couple the data path of the switch **5Z** to those of the data stores **52**, and the bus **562** may electrically couple a power supply in or through the switch**5Z** to the data stores **52**.

The computer **5** may operate in any of N states, where N is the number of data stores **52**. In a first state, the data-store switch **5Z** enables the first data store **52a** to communicate with the peripheral controller **57**. In the second state, the switch **5Z** enables the second data store **52b** to communicate with the peripheral controller **57**, and in the Nth state, the switch **5Z** enables the Nth data store **52α** to communicate with the peripheral controller **57**. Only one data store **52** may access the peripheral controller **57** at any given time.

In one embodiment, the computer **5** has only one controller with multiple devices. In another embodiment, the computer **5'** has multiple controllers, each with respective multiple peripherals. The switching then switches among the multiple peripherals of the first controller, the multiple peripherals of the second controller, etc. (The multiple controllers need not have the same number of multiple peripherals.)

Each data store **52** may contain self-contained software for a respective user or group of users. Each data store **52** may contain a bootable operating system, and optionally such application or data files as the user(s) corresponding to the data store **52** may require or desire.

Each user or group of users may use only a predetermined one

(or more) of the data stores **52**. Thus, before using the computer **5**, a user sets the switch **5Z** to the predetermined position enabling the data store **52** corresponding to that user to communicate via the controller **57**.

In this way, a first user's data is separated from a second user's data on the same computer. The computer **5** more effectively separates users' data by enforcing security at a physical level rather than at the logical (software-enforced) level typical of multi-user operating systems.

In this scenario, re-booting between switches is desirable. Re-booting clears out the memory **51** in the switch from one user to another. Also desirable is a multi-key, multi-position lock. Any one key may turn the lock to any one predetermined position, enabling one corresponding data store **52**.

The invention now being fully described, one of ordinary skill in the art will readily recognize many changes and modifications that can be made thereto without departing from the spirit of the appended claims. For example, in addition to switching software, data stores or other peripherals as described above, a computer may also switch properly functioning hardware for malfunctioning hardware. Indeed, in a computer with multiple mother boards, a switch may switch the functioning components of a computer from one board to another.

Also, while the description above usually uses data stores as the devices to switch, one of skill in the art will readily now realize that other computer components may be switched, including logic boards, ROM and controllers.

Under certain circumstances, danger or damage may follow from switching when power is supplied. Accordingly, a switch may be deactivated when such danger or damage may result. Logic such as the controller **1A** may prevent dangerous or damaging switching by tracking power states, device identities, etc. and permitting switching, for example, when no electrical current is flowing to the devices to be switched.

Preferably, the switch is located in an easy-to-reach location. This contrasts with the typical location of USB, keyboard and other ports, for example.

Attached is a 209-page Appendix which is a part of this specification. The Appendix includes the following documents:

- "Description of Self-Repairing System" (Text, 5 pages; Drawings, 4 Pages; Code, 5 Pages)
- "Backup and/or Repair System - Multi-User System" (Text, 43 Pages)
- Diagrams (Text, 18 Pages)
- Table of Which Diagrams Go With Which Embodiments (Text, 1 Page)
- Figures, S Series (Drawings, 20 Pages)
- Figures, F Series (Drawings, 38 Pages)
- Figures, W Series (Drawings, 32 Pages)
- Figures, M Series (Drawings, 5 Pages)
- Figures, E Series (Drawings, 17 Pages)
- Figures, L Series (Drawings, 21 Pages)

20011209.9594.DOT

WHAT IS CLAIMED IS:

1. A method for a computer repairing itself, the method comprising the computer-executed steps of:

booting from a first boot device;

then, in response to a signal indicating a need for repair, booting from a second boot device; and

then repairing software on the first boot device while booted from the second boot device.

2. The method of claim 1, wherein the step of repairing software comprises

copying software from a device other than the first boot device onto the first boot device.

3. The method of claim 1, wherein the step of repairing software comprises

copying software from the second boot device onto the first boot device.

4. The method of claim 1, wherein the step of repairing software comprises

copying template, backup and/or archive software from a device other than the first boot device onto the first boot device.

5. A method for a computer repairing itself, the method comprising the computer-executed steps of:

booting from a first boot device;

then, in response to a signal indicating a need for repair, booting from a second boot device; and

then, while booted from the second boot device, copying

template, backup and/or archive software from the second boot device onto the first boot device.

Applied Materials

2017120989h2007

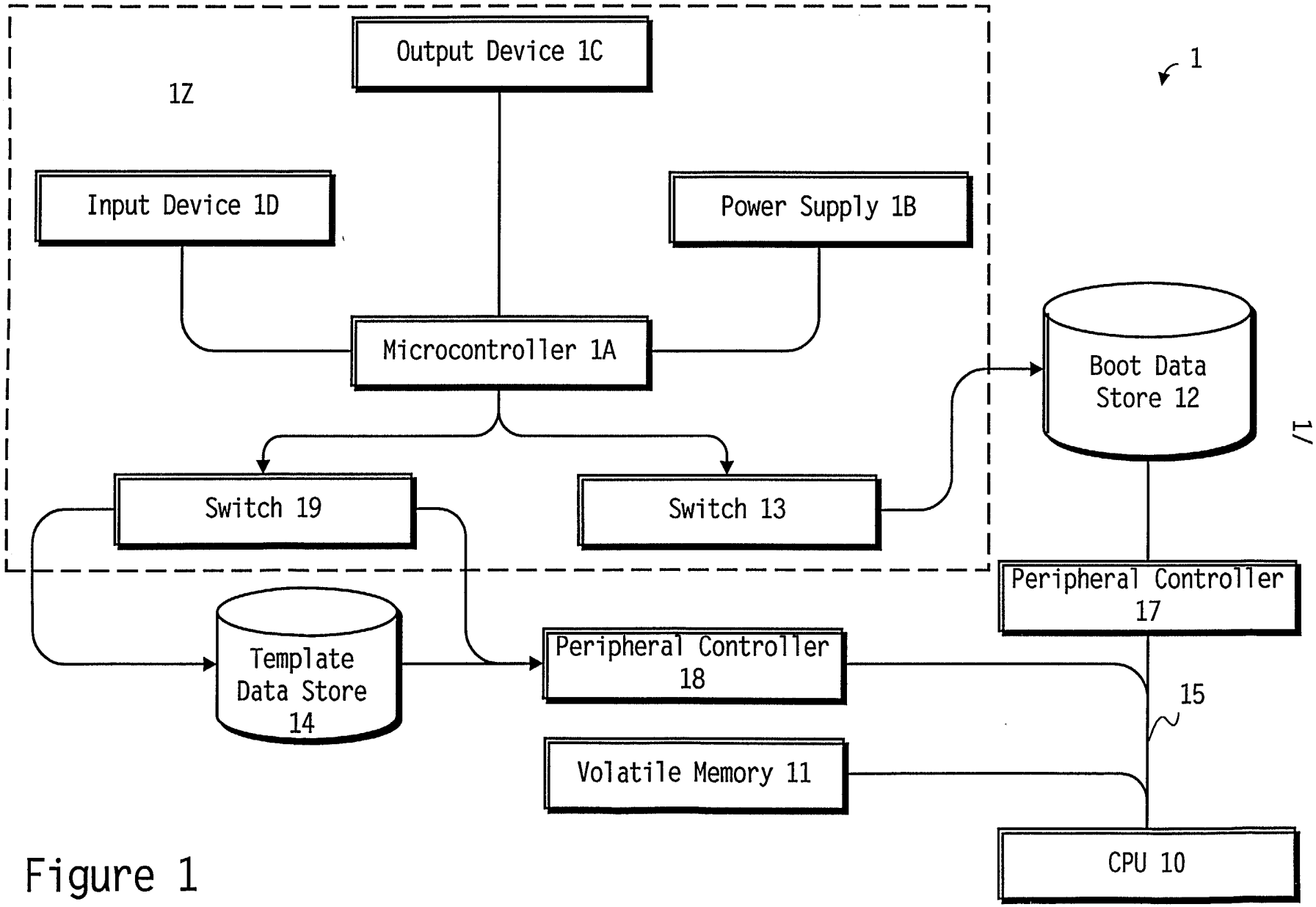


Figure 1

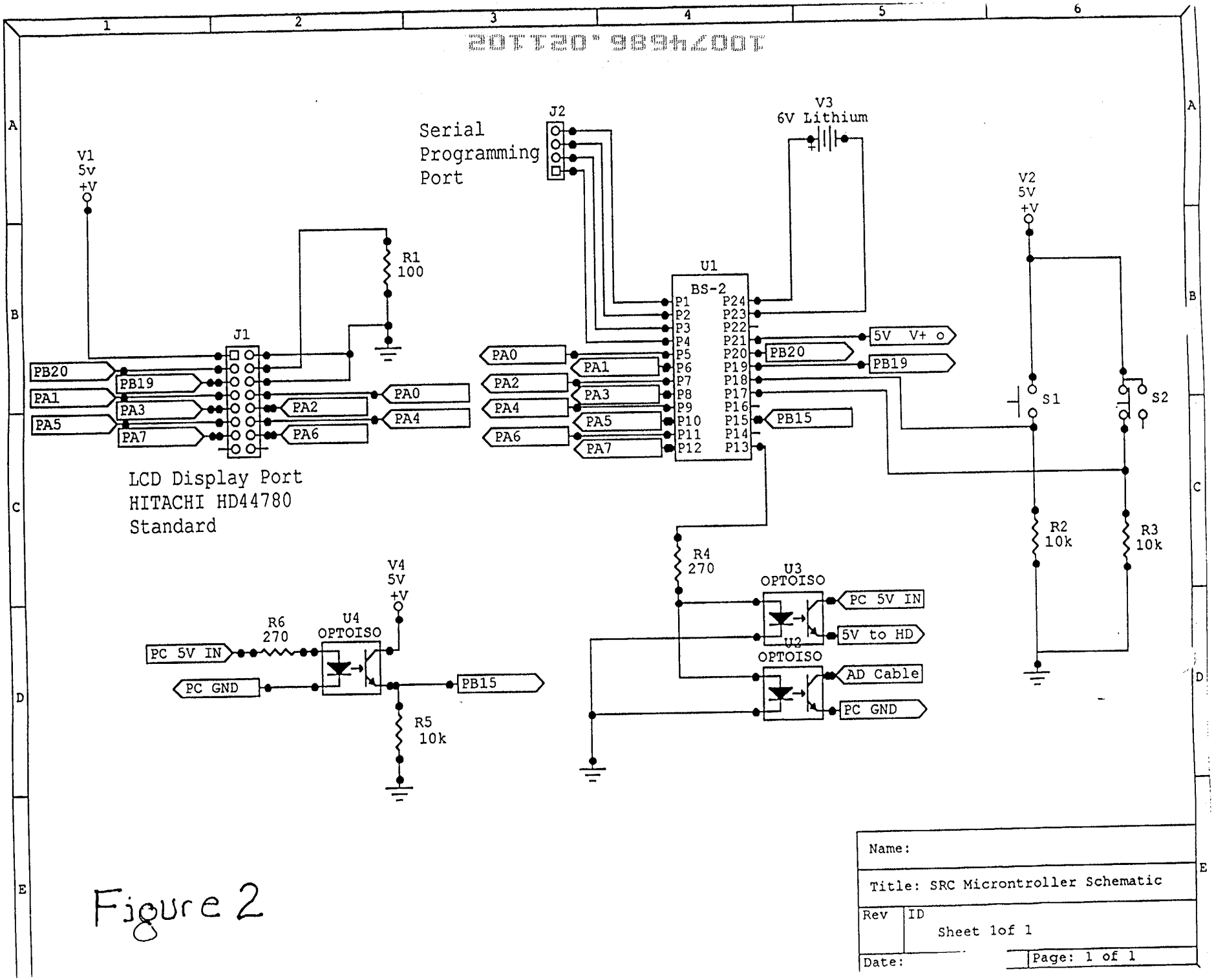


Figure 2

Name:	
Title: SRC Microntroller Schematic	
Rev	ID
	Sheet 1of 1
Date:	Page: 1 of 1

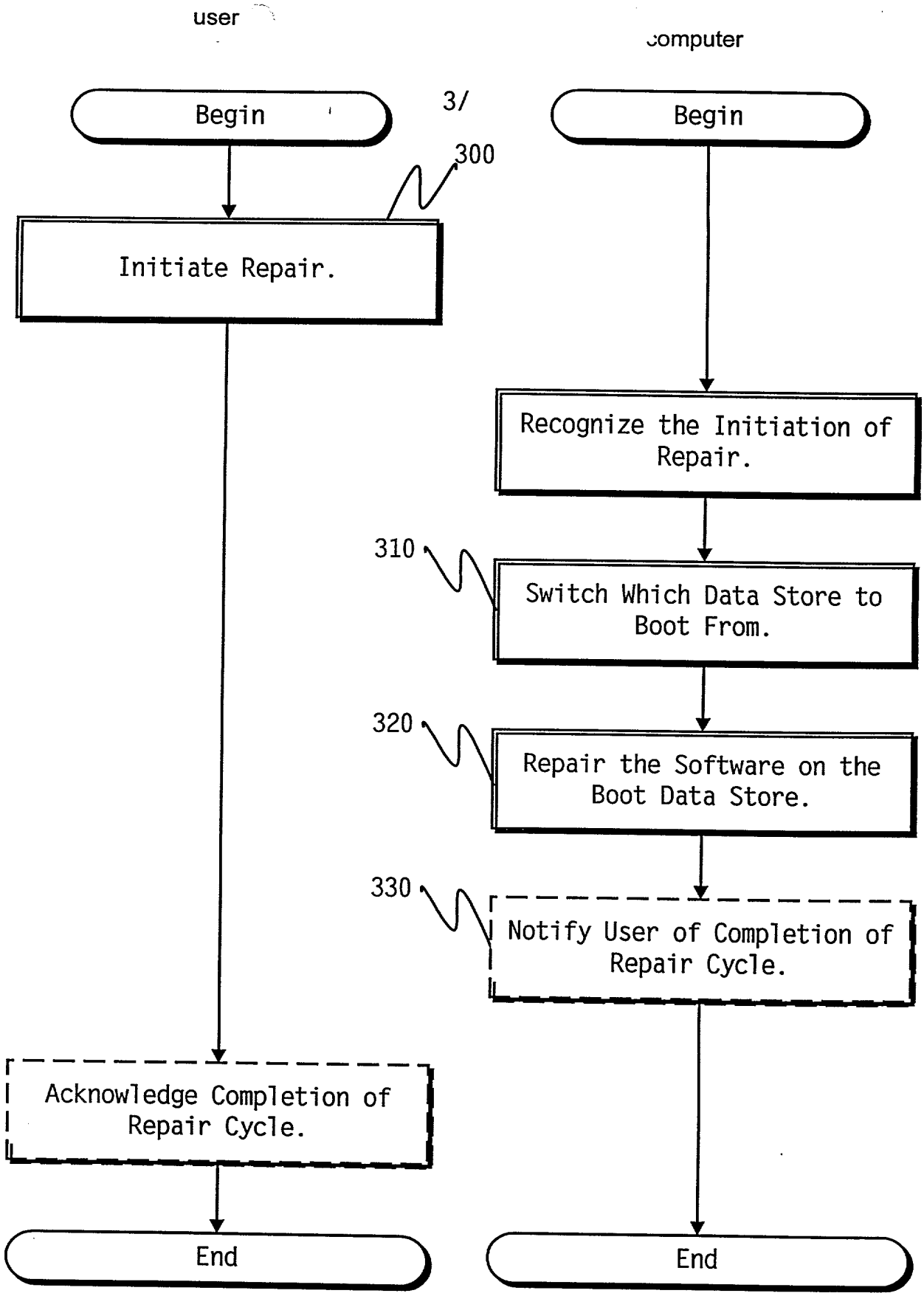


Figure 3A

Figure 3B

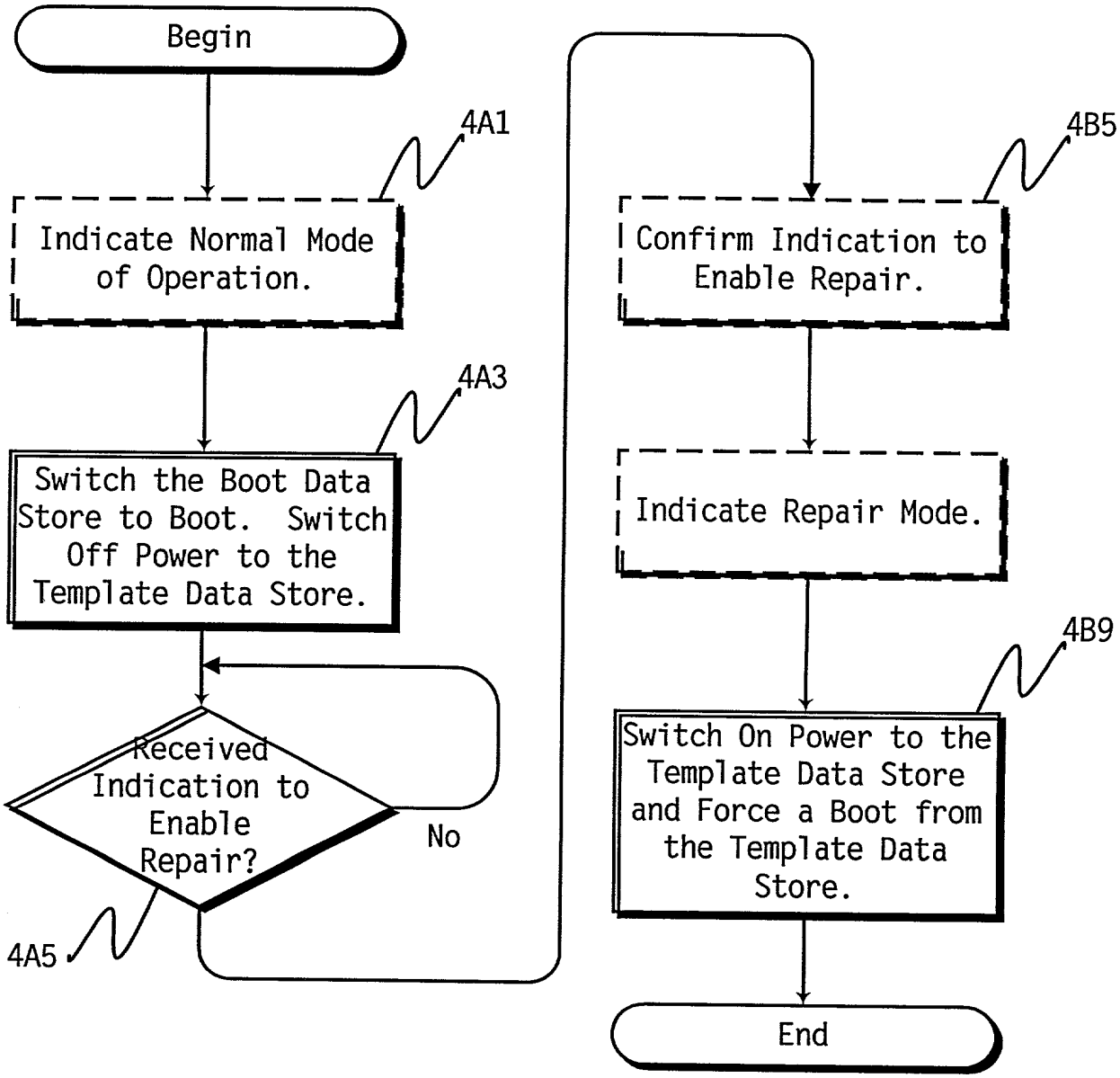
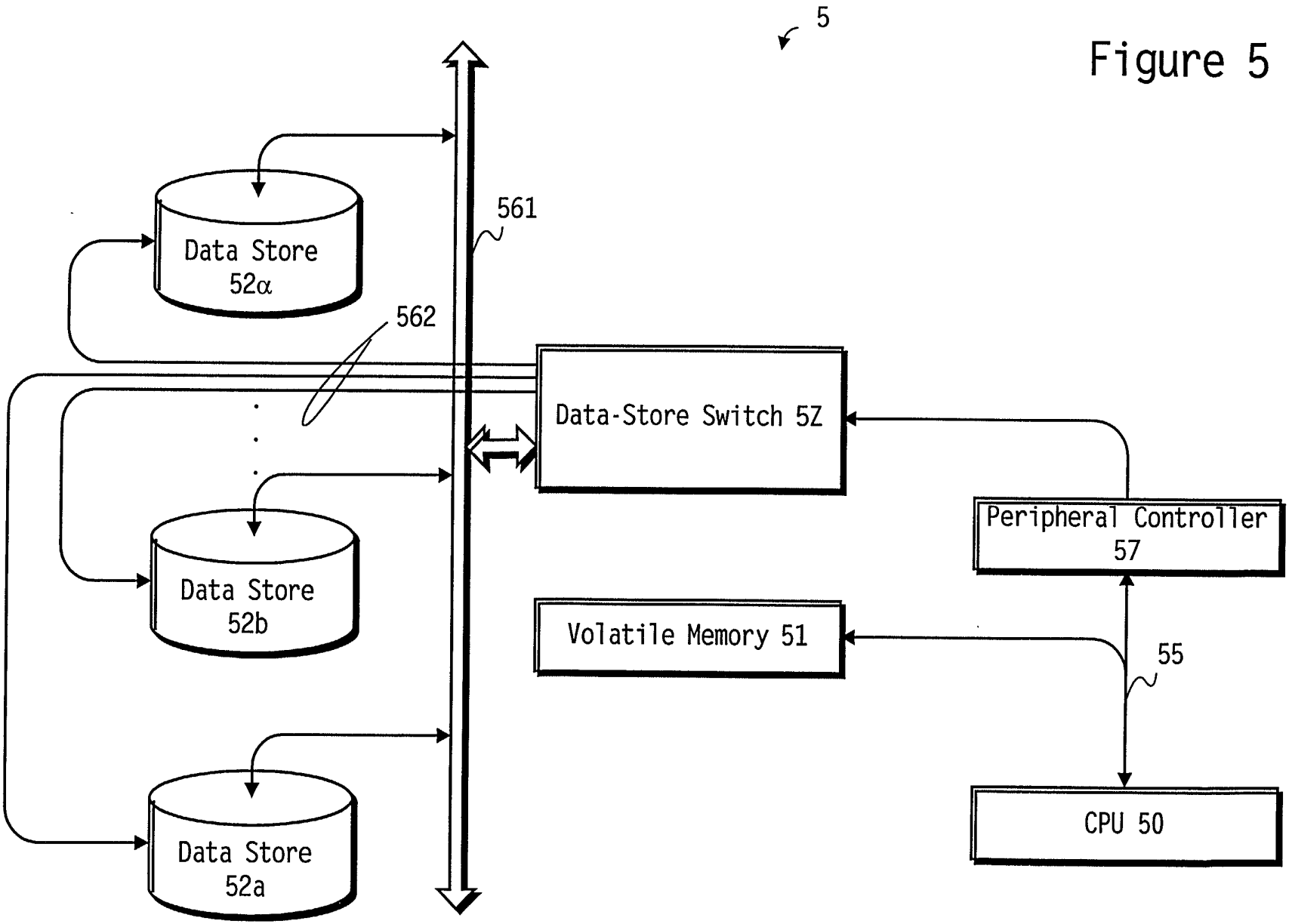

Begin
4A1
Indicate Normal Mode of Operation.
4A3
Switch the Boot Data Store to Boot. Switch Off Power to the Template Data Store.
Received Indication to Enable Repair?
No
4A5
4B5
Confirm Indication to Enable Repair.
Indicate Repair Mode.
4B9
Switch On Power to the Template Data Store and Force a Boot from the Template Data Store.
End

Figure 4

Figure 5


5
561
562
Data Store
52α
Data Store
52b
Data Store
52a
Data-Store Switch 5Z
Peripheral Controller
57
Volatile Memory 51
55
CPU 50

20TT20' 9859h/001

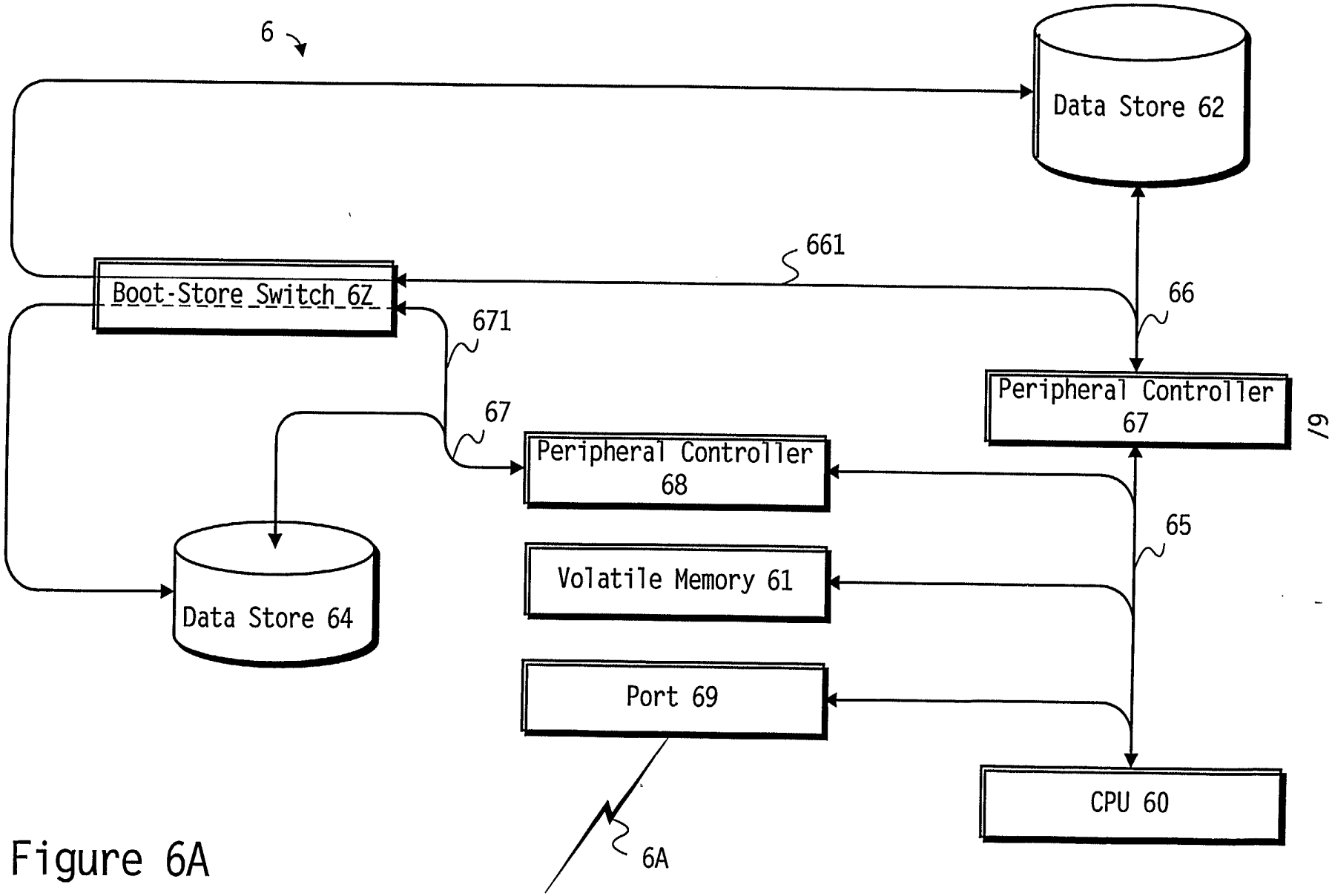


Figure 6A

20T120"9859h200T

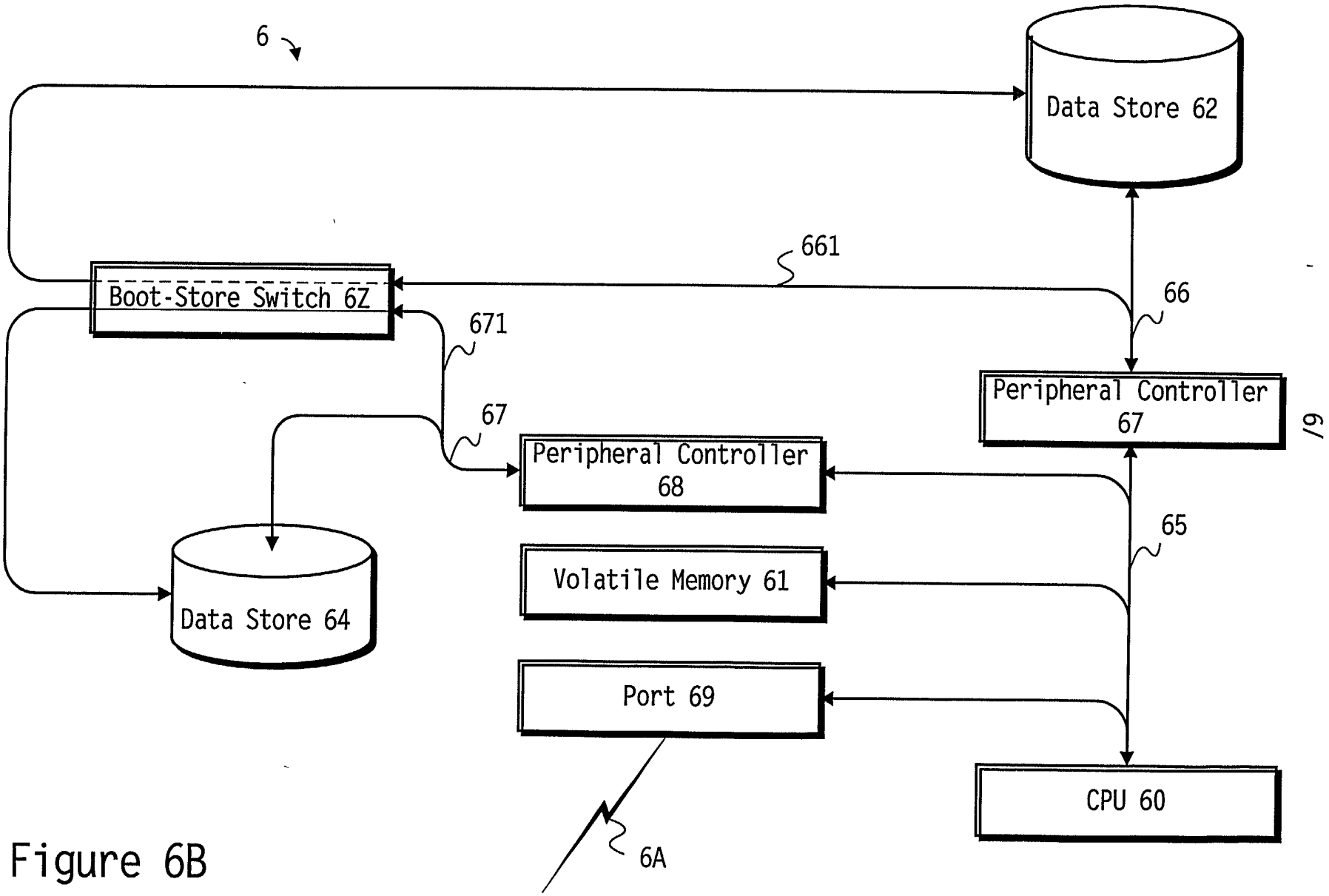


Figure 6B

20120907 9894 2001

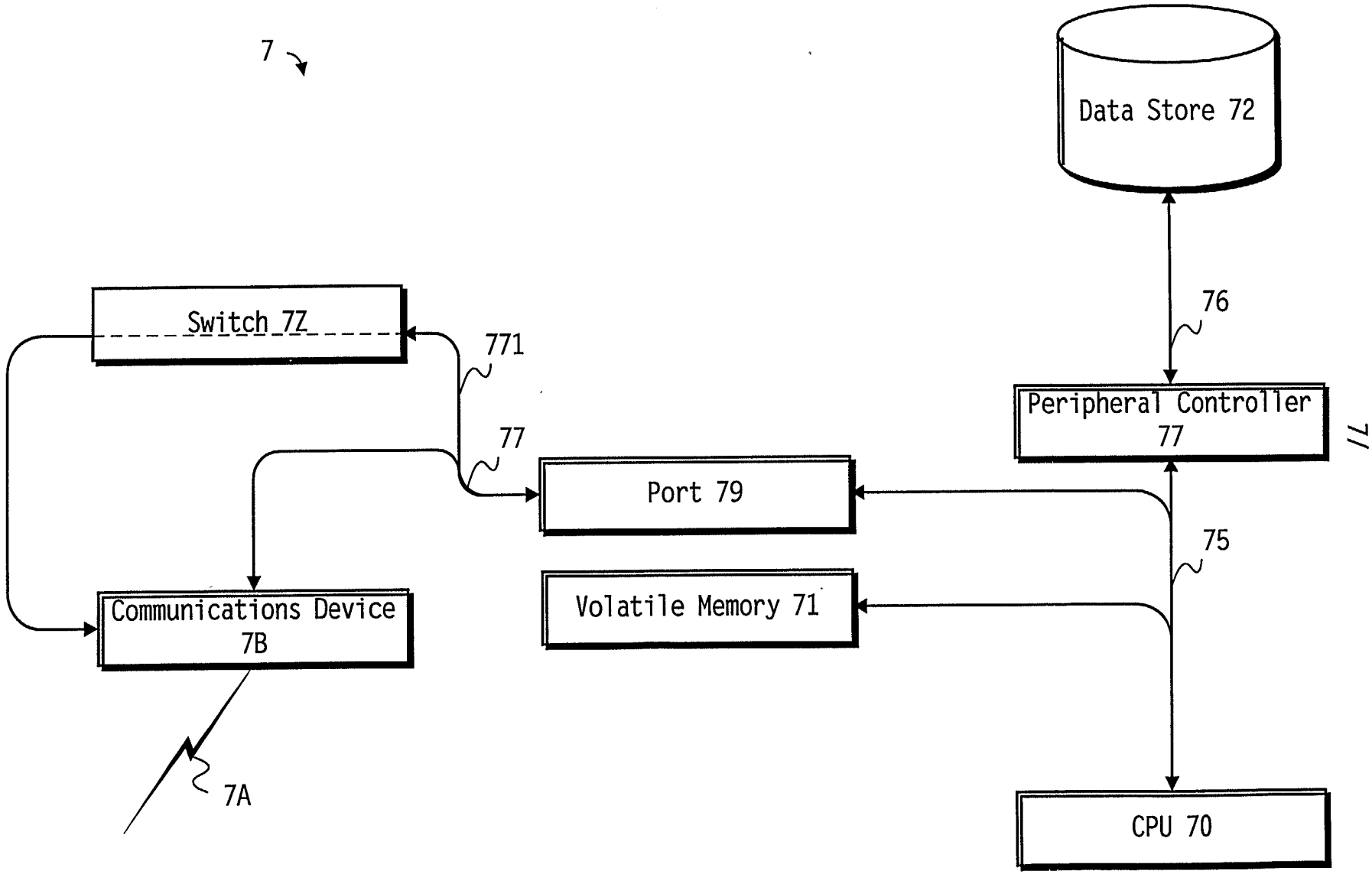


Figure 7A

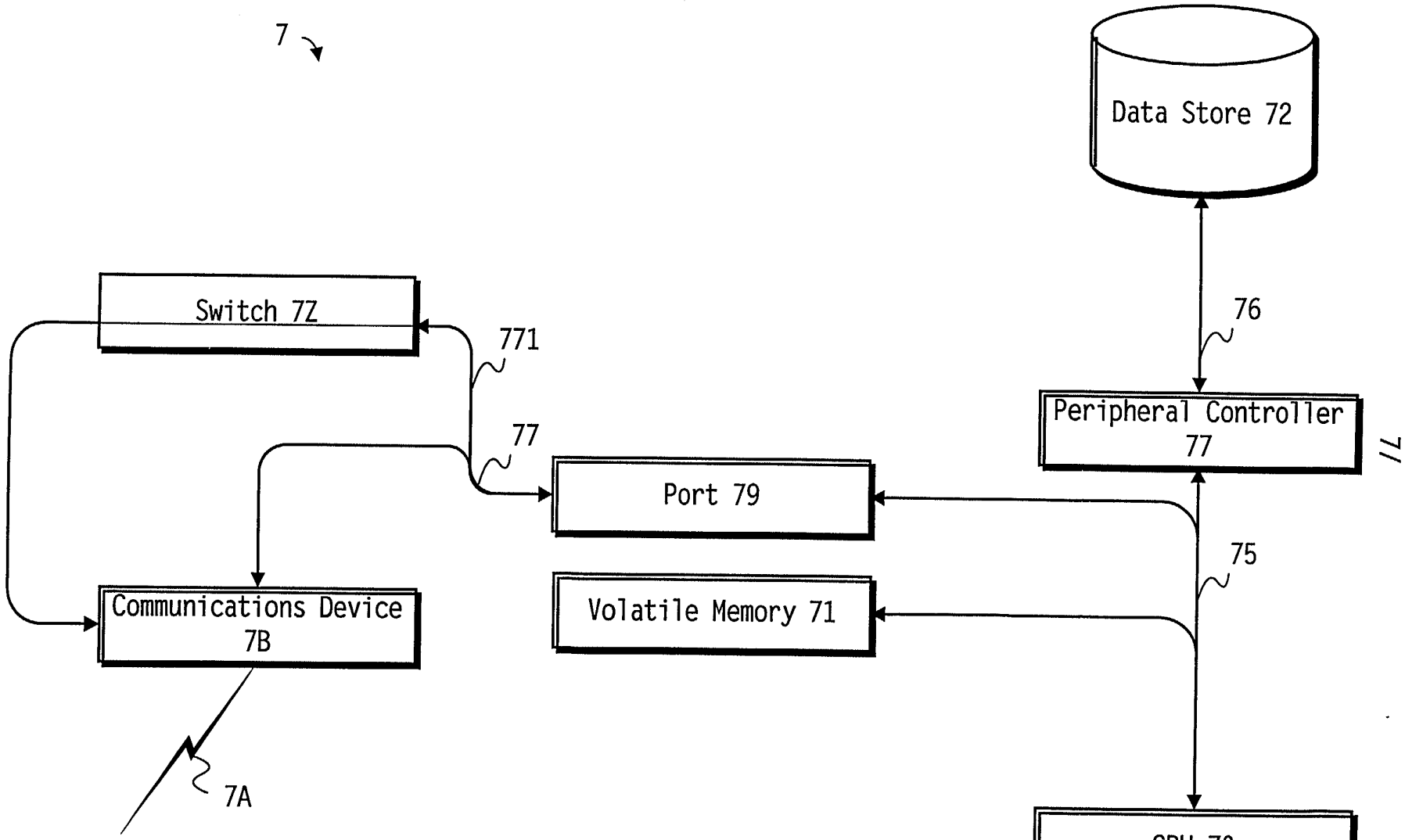
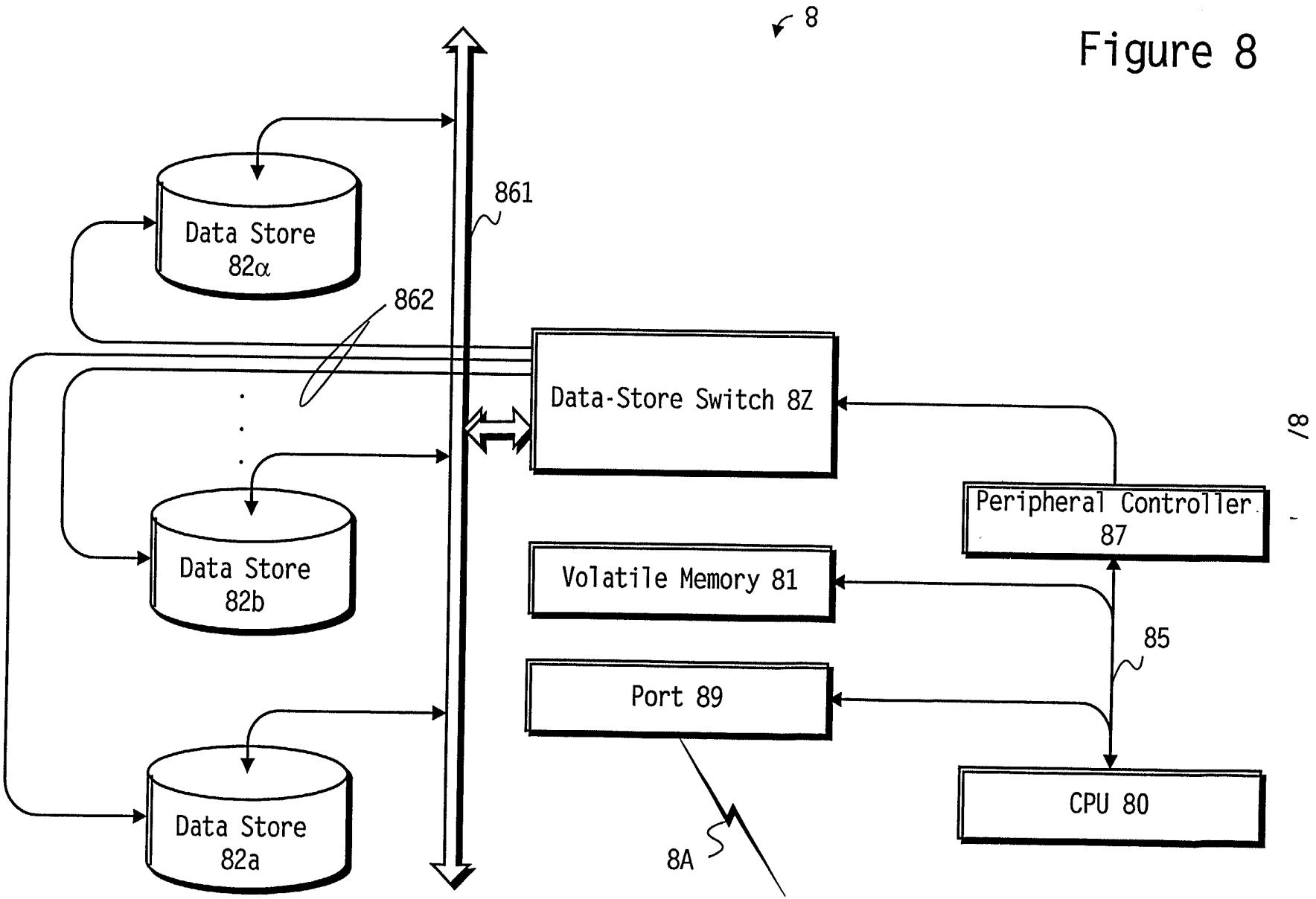

7
Data Store 72
76
Switch 7Z
771
77
Peripheral Controller
77
7/
Port 79
75
Communications Device
7B
Volatile Memory 71
7A
CPU 70

Figure 7B

20T120 9859h200T

Figure 8



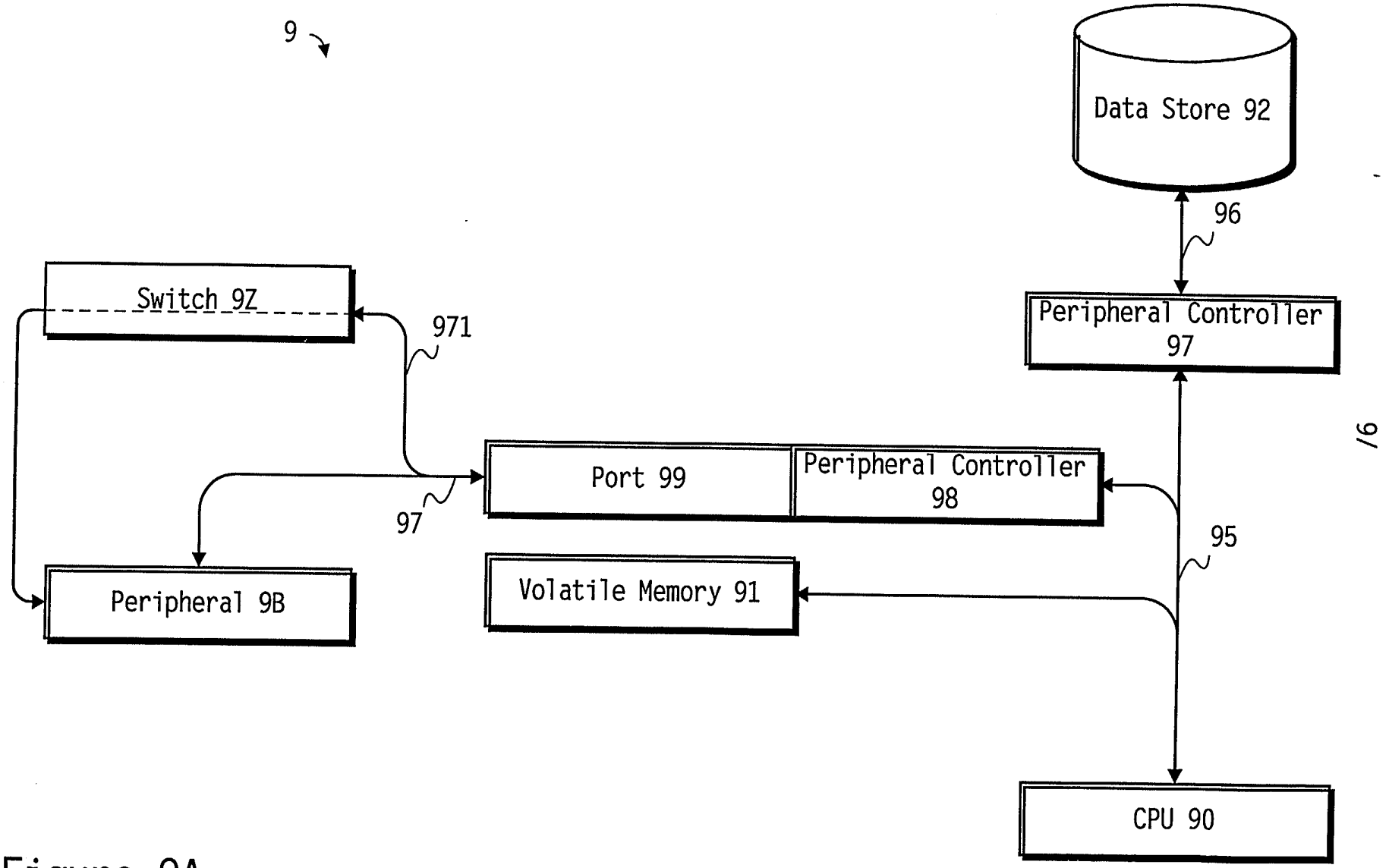

9
Data Store 92
96
Switch 9Z
971
Peripheral Controller 97
Port 99
Peripheral Controller 98
97
95
Peripheral 9B
Volatile Memory 91
CPU 90

Figure 9A

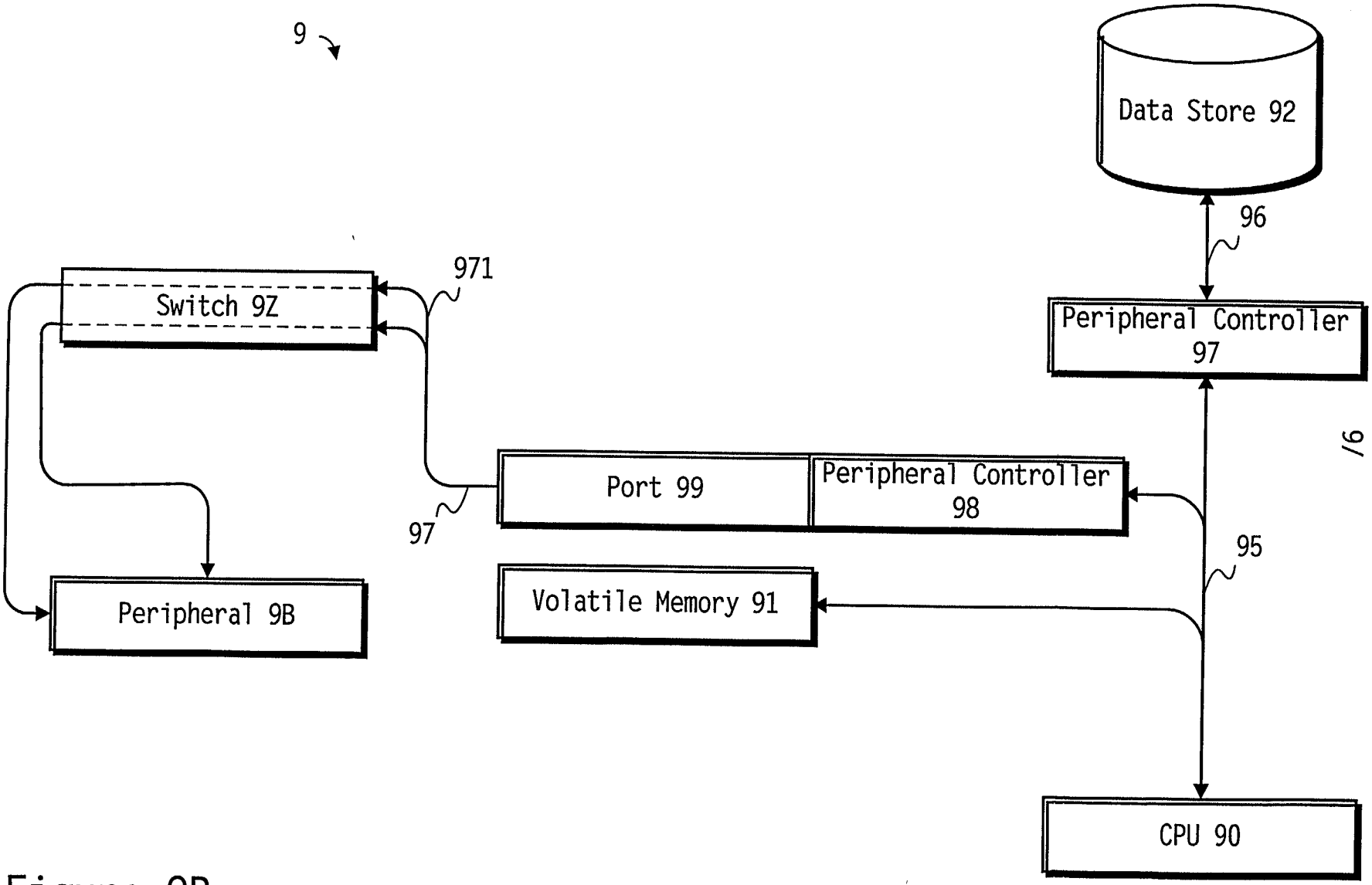

9
Data Store 92
96
971
Switch 9Z
Peripheral Controller 97
Port 99
Peripheral Controller 98
97
95
Peripheral 9B
Volatile Memory 91
CPU 90

Figure 9B

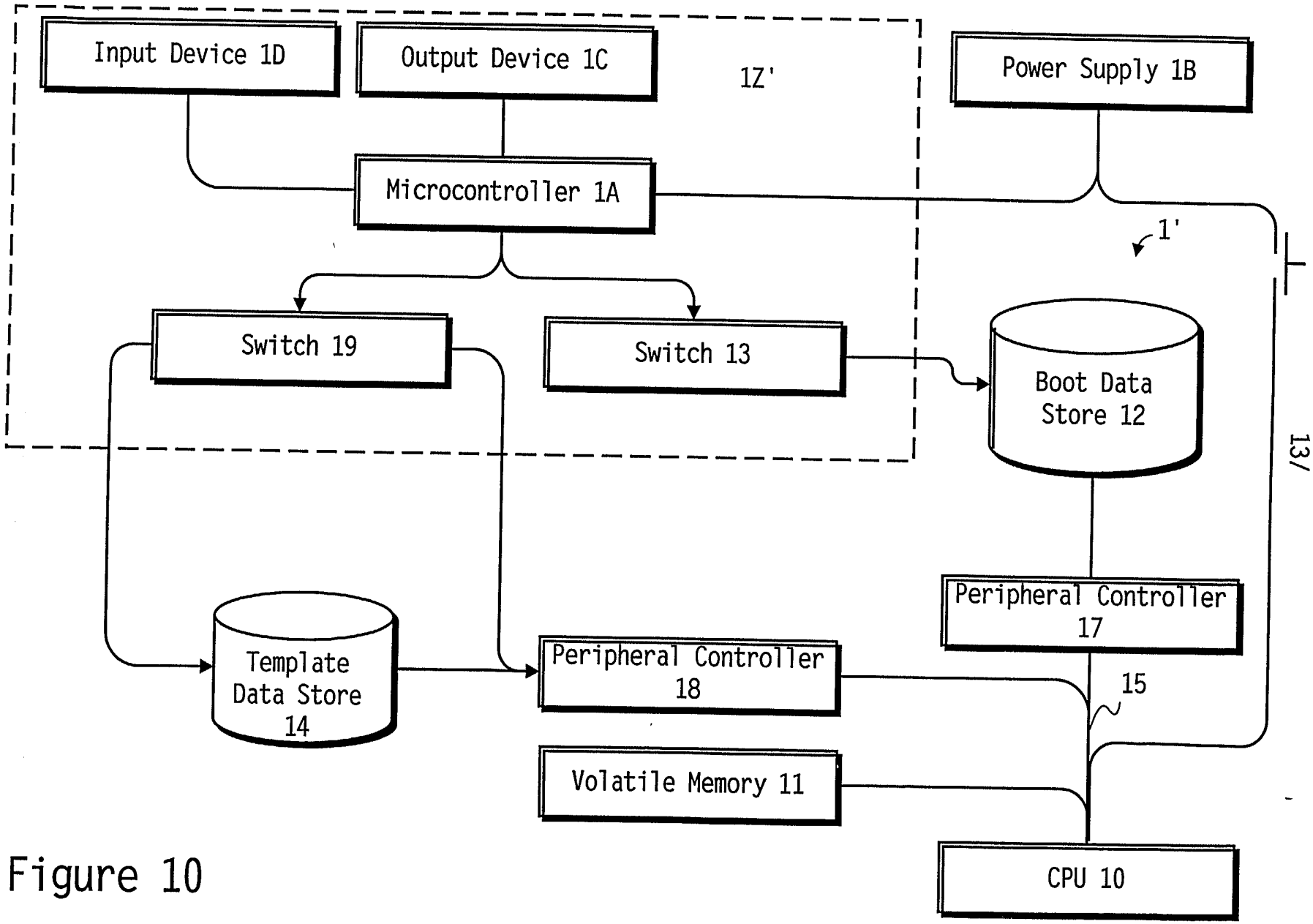

Input Device 1D
Output Device 1C
1Z'
Power Supply 1B
Microcontroller 1A
1'
Switch 19
Switch 13
Boot Data Store 12
13/
Peripheral Controller 17
Template Data Store 14
Peripheral Controller 18
15
Volatile Memory 11
CPU 10

Figure 10

APPENDIX

Description of Self-Repairing System:

When power is applied to the system, the micro controller powers up, initializes the LCD prompt screen and the "Ready for Normal Operation" prompt is displayed. At this point the micro controller waits until the single pole single throw switch (S1) is pressed. When S1 is pressed the micro controller prompts the user "Repair Selected".

The position of the slider switch S2 is now stored in memory. Then based on the switch's initial location the user is instructed to slide the switch opposite its initial position to confirm the repair request: "Please slide switch from A->B" or "Please slide switch from B->A".

At this point or any other time (except when a "Repair in Progress"), the user can cancel the repair request by pressing the pushbutton switch, at which point the dialog "Repair Cancelled" is displayed. The system will then return to "Ready for Normal Operation" mode.

If the user wishes to confirm the repair, and moves the slide switch as instructed, the computer will check the power status of the computer. The micro controller reads the logic level of opto-isolator U4. Logic high represents the computer being powered. If the computer is on, the user will be prompted to "Please Shutdown the Computer". The computer then again reads in the logic level of U4.

If the computer has been shut down U4 will output a logic low. After the controller confirms that the computer is off the user is then prompted to restart the computer

At this point solid-state relay U3 and opto-isolator U2 are enabled. This ensures that when the computer is restarted the Master hard drive receives power as IDE ID0 and the internal user drive boots with its ID switched to Address 1 (ID1).

When the computer is restarted, U4 outputs logic high to the micro controller. This signal denotes that the computer is powered and prompts the "Repair in Progress" message, which is displayed on the LCD screen. Once the repair process is enabled the micro controller displays this message and executes no other commands until the computer is shutdown (U4 outputs a logic low signal).

When the computer is shutdown by the repair software, the micro controller informs the user that the process is complete with the "Repair Complete" dialog.

The micro controller then enters the "Ready for Normal Operation" mode and waits for a new repair process.

Hardware description:

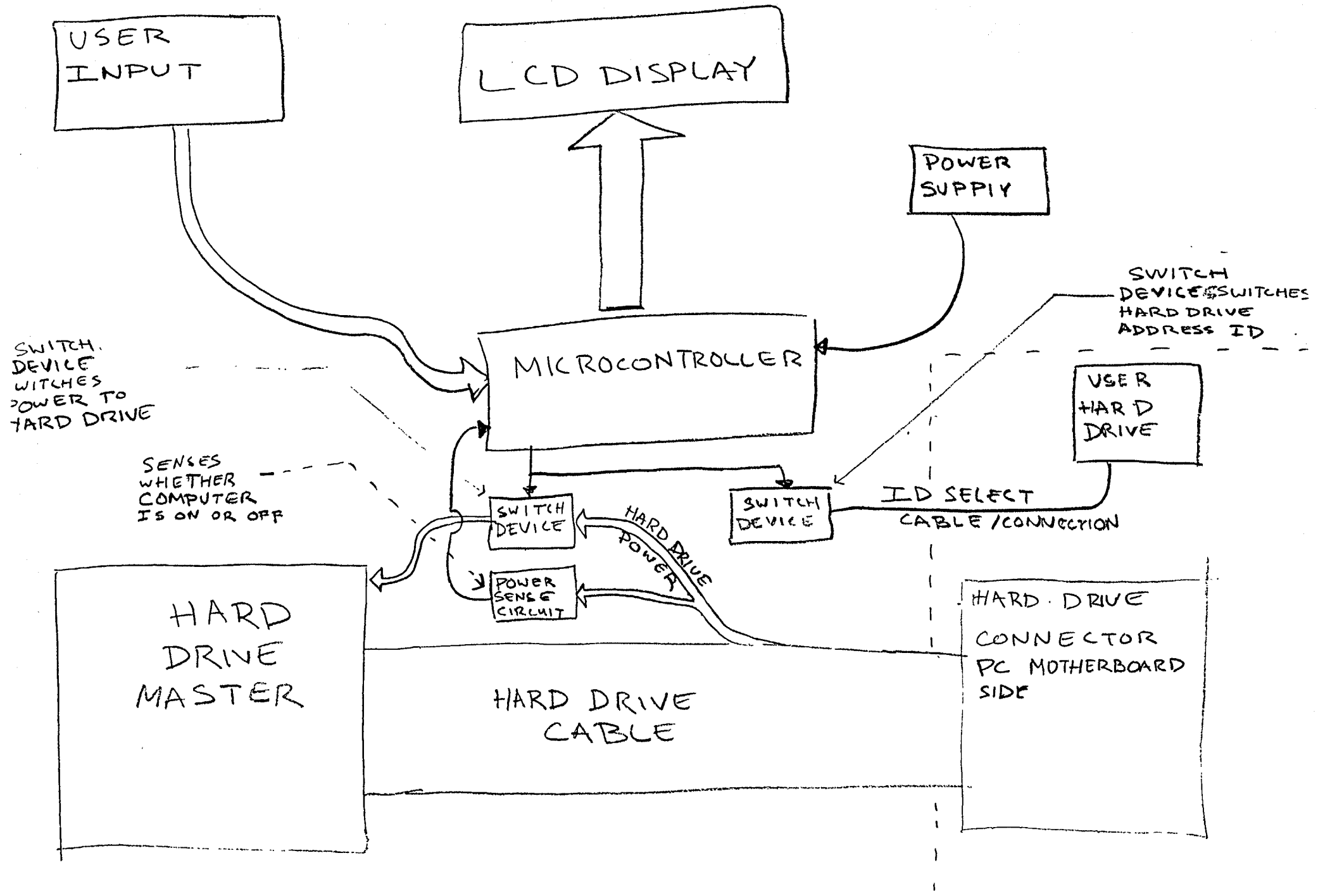
The microcontroller at the heart of the system is a Basic Stamp II micro controller which controls the repair progress, LCD user interface and also supplies a 5 volt regulated power supply for all the devices in the circuit.

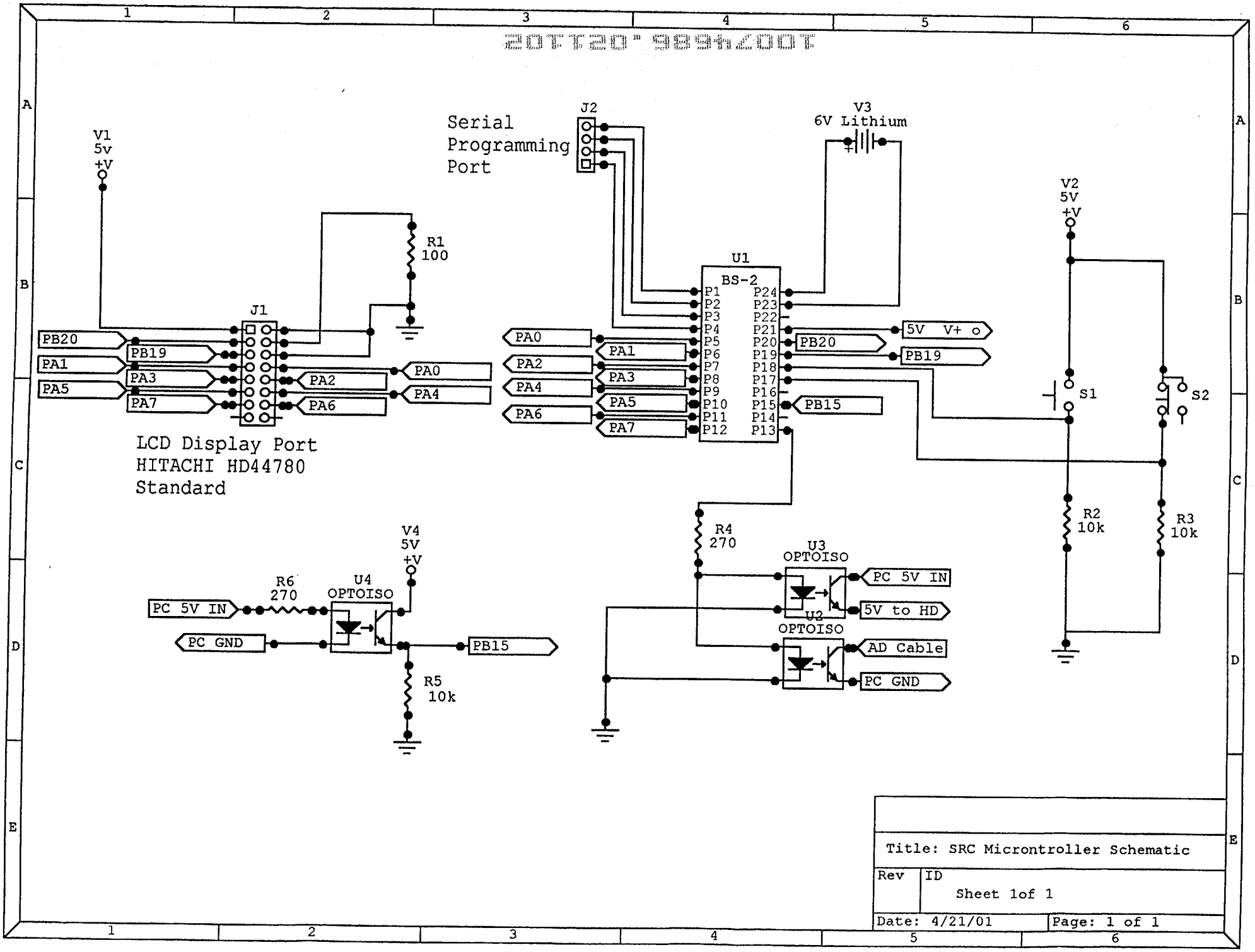
The optional LCD screen is a 2X16 character LCD based on the industry standard Hitachi HD44780 controller chip.

The solid-state relay, which switches power to the master hard drive, is an International Rectifier PVN012. Any switching device could be used to switch hard drive power.

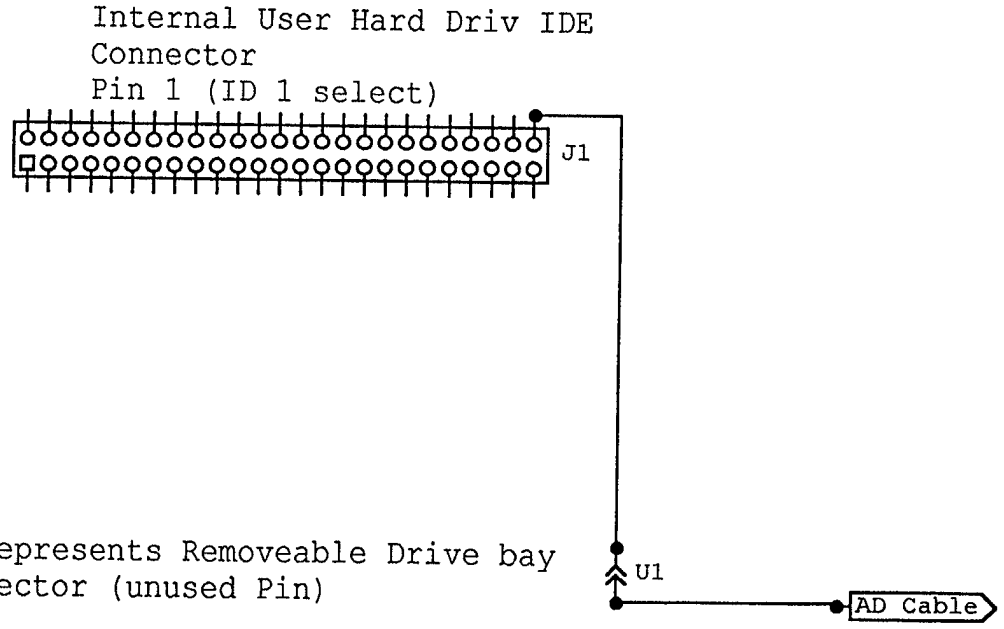
The other opto-isolators are NEC 2501.

The batteries are quantity 2 – 3 volt 1200ma Lithium batteries connected in series for a 6 volt output. This powers a voltage regulator on the Micro controller, which supplies 5 volts to the rest of the circuit. Any power supply from 5.1 volts to 15 volts can be used.


USER INPUT
LCD DISPLAY
POWER SUPPLY
SWITCH DEVICE SWITCHES HARD DRIVE ADDRESS ID
SWITCH DEVICE TO HARD DRIVE
MICROCONTROLLER
USER HARD DRIVE
SENSES WHETHER COMPUTER IS ON OR OFF
SWITCH DEVICE
SWITCH DEVICE
ID SELECT CABLE / CONNECTION
HARD DRIVE POWER
POWER SENSE CIRCUIT
HARD DRIVE MASTER
HARD DRIVE CABLE
HARD DRIVE CONNECTOR PC MOTHERBOARD SIDE

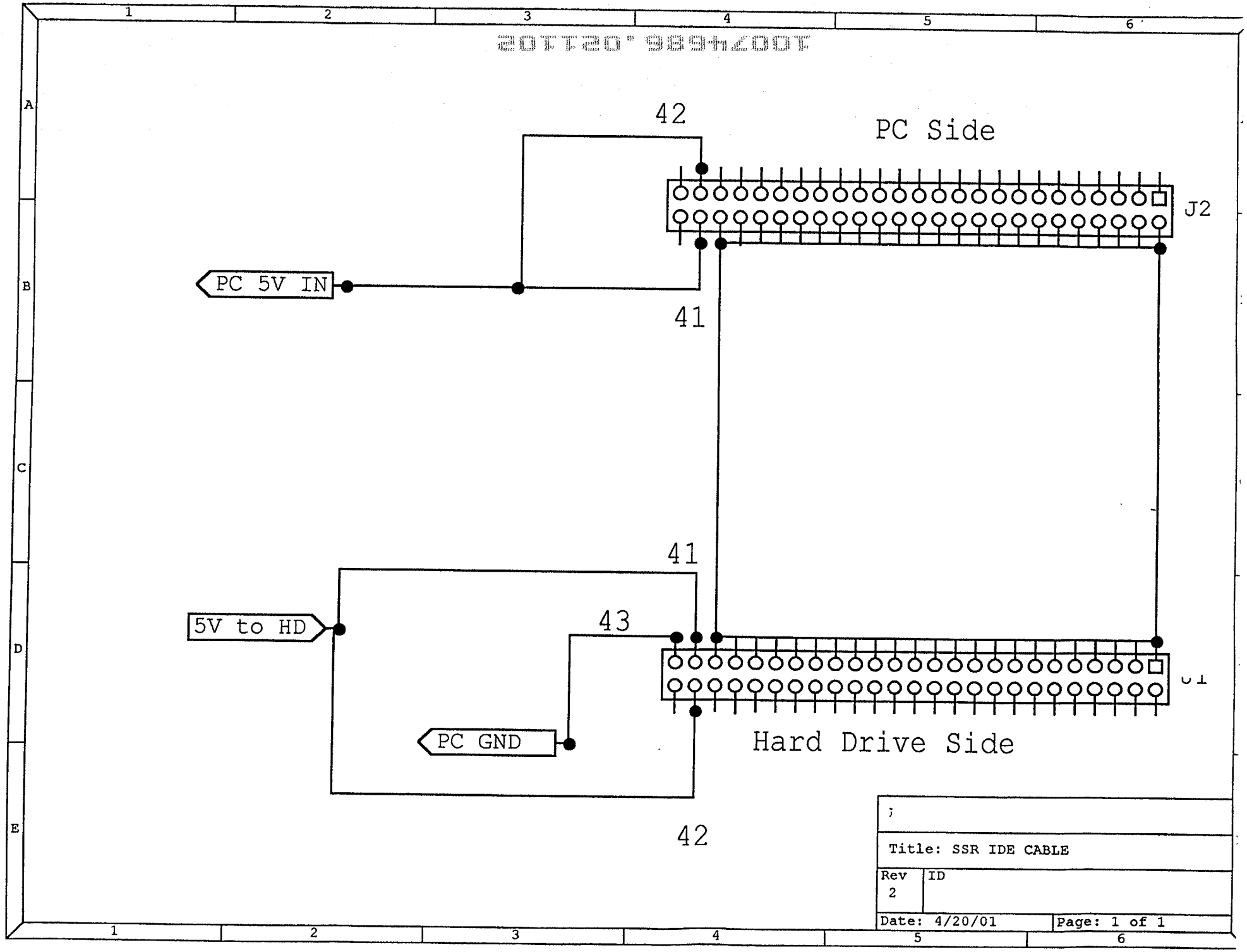

Serial
Programming
Port
J2
V3
6V Lithium
V1
5v
+V
R1
100
U1
BS-2
V2
5V
+V
J1
PB20
PB19
PA1
PA3
PA5
PA7
PA2
PA0
PA4
PA6
PA0
PA1
PA2
PA3
PA4
PA5
PA6
PA7
P1
P2
P3
P4
P5
P6
P7
P8
P9
P10
P11
P12
P24
P23
P22
P21
P20
P19
P18
P17
P16
P15
P14
P13
5V V+
PB20
PB19
PB15
S1
S2
LCD Display Port
HITACHI HD44780
Standard
R4
270
R2
10k
R3
10k
V4
5V
+V
R6
270
U4
OPTOISO
PC 5V IN
PC GND
PB15
R5
10k
U3
OPTOISO
PC 5V IN
5V to HD
U2
OPTOISO
AD Cable
PC GND
Title: SRC Microntroller Schematic
Rev
ID
Sheet 1of 1
Date: 4/21/01
Page: 1 of 1

Address Select Cable



U1 Represents Removeable Drive bay connector (unused Pin)

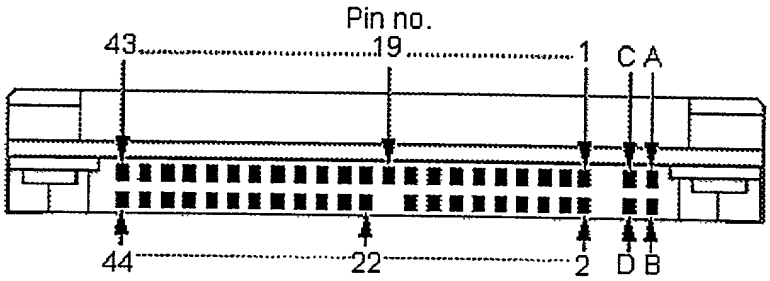
Title:SSR ADDRESS SELECT CABLE	
Rev	ID
Date: 4/21/01	Page: 1 of 1


42
PC Side
J2
PC 5V IN
41
41
5V to HD
43
PC GND
Hard Drive Side
42
Title: SSR IDE CABLE
Rev 2
ID
Date: 4/20/01
Page: 1 of 1

Cable Pinout

Hard Drive Pinout (from IBM website)

Travelstar 20GN, 30GT, 32GH
Models: DJSA-232, 230, 220, 210, 205



Notes: A/T = IDE. Pin position 20 is left blank for secure connector insertion. Pin position A,B,C, and D are used for drive ad

Signal definition

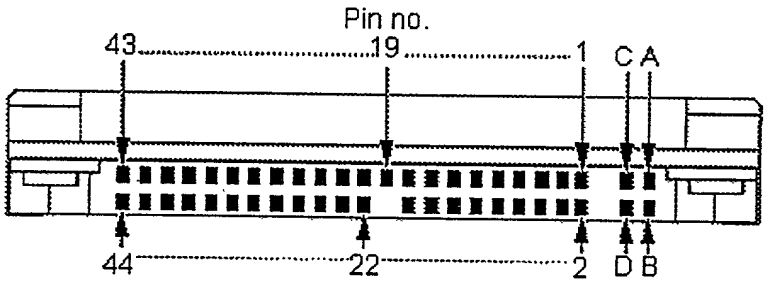
As shown in the schematic diagrams, the IDE Hard Drive cable is a standard 'Hard Drive extension cable. The Hard Drive power connections (cable lines 41 and 42 have been cut and rout the circuit's solid state relay which switches the hard drive power under the microcontroller's direction. I connection has (line 43) has also been routed to the circuit board to drive the opto-isolators. The comput supply and the microcontroller power supply are separate, and interfaced through opto-isolators.

The Address Selector Cable carries the address signal connection from the internal User Hard drive to the removeable drive bay removeable connector. On that connector an unused pin is connected on the computer mother board side. The male interface connector from the removeable drive bay then interfaces to that signal when the bay is inserted into the computer. On the drive bay side the signal is then taken to the micrcontroller where the connection is switched to ground in order to change the drive address (ID selector signal pin is a floating pin that must be sinked to ground to switch).

Cable Pinout

Hard Drive Pinout (from IBM website)

Travelstar 20GN, 30GT, 32GH
Models: DJSA-232, 230, 220, 210, 205



Notes: A/T = IDE. Pin position 20 is left blank for secure connector insertion. Pin position A,B,C, and D are used for drive address setting.
Signal definition

As shown in the schematic diagrams, the IDE Hard Drive cable is a standard 'Hard Drive extension cable. The Hard Drive power connections (cable lines 41 and 42 have been cut and rout through the circuit's solid state relay which switches the hard drive power under the microcontroller's direction. PC ground connection (line 43) has also been routed to the circuit board to drive the opto-isolators. The computer power supply and the microcontroller power supply are separate, and interfaced through opto-isolators. Therefore the microcontroller ground and PC ground must be kept separate

The Address Selector Cable carries the address signal connection from the internal User Hard dri to the removeable drive bay, removeable connector. On that connector an unused pin is connected on the computer mother board side. The male interface connector from the removeable drive bay then interfaces that signal when the bay is inserted into the computer. On the drive bay side the signal is then taken to the micrcontroller where the connection is switched to ground in order to change the drive address (ID select signal pin is a floating pin that must be sinked to ground in order switch).

In other systems with different types of hard drives there are other methods of accomplishing the switchir process. The necessary signals to switch are the Hard Drive power and Drive ID. These connections may different on other computer hard drives. For example ID switching could be carried out using Cable Selec The Computer power sensing circuit could also sense power somewhere else in the computer.

```
'.....
'       Variable Declarations


Sw1                     var             IN13
Sw2                     var             IN12
Sw2_Loc                 var             byte
Sw2_Loc_Cnfrm   var             byte
Mode                    var             byte
Char                    var             b3
btnWk           var             byte
HD                      var             out8
Comp_On         var             in10
z                       var             byte
RS                      con             15
E                       con             14
LINE1           con             128
LINE2           con             128+$40
'.....
'       Variable initializations

DIRs = %1100000011111111
btnWk=0
'.....

Init_LCD:                                               'LCD INITIALIZATION
low 8                                                   'Hard Drive OFF


low RS
low E
x var byte
x=0

i_LCD:  OUTL = %00000010                        'Set to 8-bit operation.
                pulsout E, 1                                    'Send data three times
         pause 20                                       'to initialize LCD.
                pulsout E, 1
         pause 20
                pulsout E, 1
         pause 20

                outl = $0038                    'Set up LCD in accordance with
         pulsout E,1                    'Hitachi instruction manual.

        outl = %00001010                 'Turn on cursor and enable
         pulsout E,1                    'left-to-right printing.

               outl = %00001100
                pulsout E,1

               outl = %00000001
                pulsout E,1

               outl = %00000110
                pulsout E,1

         High RS                                        'Prepare to send characters.
               outl = %00000101
                pulsout E,1
               outl = %00000011
                pulsout E,1

        Gosub CLR
'.....
Start:
                                                        'idle mode
       HD=0                                                     'Hard Drive off - Normal operation
       gosub Ready_Mesg

Idle:
       BUTTON 13,1,255,0,btnWk,1,Repair                 ' check pushbutton switch

       goto Idle


Repair:
            gosub GETSW_LOC

            if SW2_LOC= "A" then UPDLOC
                    SW2_LOC_CNFRM= "A"

            goto Repair1

            UPDLOC:
            SW2_LOC_CNFRM= "B"
```

```
Repair1:

        gosub CLR

                low RS
                x=LINE1+4                               'center text on top line
                gosub Send_data
                high RS


        for b2=0 to 14
                Lookup b2,["Repair Selected"],b3
                x=b3
                gosub Send_data
                next
        pause 500


                low RS                                          'format text
                x=Line2+1
                gosub send_data
                high RS


        for b2=0 to 17
                Lookup b2,["Slide Switch From "],b3
                x=b3
                gosub Send_data
        next


        x=Sw2_Loc
        gosub send_data

        x="-"
        gosub send_data

        x=">"
        gosub send_data

        x=SW2_Loc_Cnfrm
        gosub send_data


Cnfrm_loop:
                gosub Getsw_Loc                                 ' Get Current Switch Location
                BUTTON 13,1,255,0,btnWk,1,Cancel                ' check pushbutton switch

                if Sw2_Loc = Sw2_Loc_Cnfrm Then Enable_Repair   'check for confirmation or cancellation
goto Cnfrm_loop


Enable_Repair

        if Comp_On = 1 then Prompt_Shutdown

        goto Prompt_Restart


Prompt_Shutdown:

        gosub Shutdown_Mesg


Shutdown_Loop:

        If Comp_On = 0 then Prompt_Restart
        BUTTON 13,1,255,0,btnWk,1,Cancel
goto Shutdown_Loop



Prompt_Restart

        HD = 1                                          'Enable Hard Drive - Normal Addressing
        gosub Restart_Mesg

Restart_Loop:

        If Comp_On=1 Then In_Progress

        BUTTON 13,1,255,0,btnWk,1,Cancel
goto Restart_Loop
```

```
In_Progress:
        Gosub Progress_Mesg
        pause 200
        If Comp_On=0 then Repair_End
        pause 300
        gosub ClR
        Pause 200
        If Comp_On=0 then Repair_End
        Pause 300
        Gosub ClR
Goto In_Progress

Cancel:
        gosub CLR
        pause 400
        gosub Cancel_Mesg
        pause 400
        gosub CLR
        pause 400
        gosub Cancel_Mesg
        pause 400
        gosub CLR
        pause 400
        gosub Cancel_Mesg
        pause 400

goto Start
Repair_End:

        HD = 0                          'Disable Hard Drive - Return to Normal Mode

        Gosub CLR
        pause 400
        Gosub Complete_Mesg
        pause 400
        Gosub CLR
        Gosub Complete_Mesg
        pause 400
        Gosub CLR
        Gosub Complete_Mesg
        pause 400
        Gosub CLR

goto Start
'.....
'                       Messaging Subroutines
Ready_Mesg:
gosub CLR

        low RS
        X=LINE1+7                                               'center text on top line
        gosub Send_data
        high RS

        for b2=0 to 8
                Lookup b2,["Ready For" ],b3
                x=b3
                gosub Send_data
        next

        low RS
        x=Line2+4
        gosub send_data
        high RS

        for b2=0 to 15
                Lookup b2,["Normal Operation"],b3
                x=b3
                gosub Send_data
        next

return
'.....
Repair_Mesg

        gosub CLR
                low RS
                X=LINE1+4                                       'center text on top line
                gosub Send_data
                high RS


        for b2=0 to 14
                Lookup b2,["Repair Selected"],b3
                x=b3
                gosub Send_data
        next
```

```
return
'.....................................................................................
Cancel_Mesg:

              gosub CLR


              Low RS
              x=LINE1+4                          'center text on top line
              gosub Send_data
              high RS

       for b2=0 to 15
              Lookup b2,["R","e","p","a","i","r"," ","C","a","n","c","e","l","l","e","d"],b3
              x=b3
              gosub Send_data
              next

return
'.....................................................................................
Shutdown_Mesg:

       Gosub CLR

              for b2=0 to 23
              Lookup b2,["P","l","e","a","s","e"," ","S","h","u","t","d","o","w","n","
","C","o","m","p","u","t","e","r"],b3
              x= b3
              gosub send_data
              next
return
'.....................................................................................
Restart_Mesg:

       Gosub CLR

              for b2=0 to 22
              Lookup b2,["P","l","e","a","s","e"," ","R","e","s","t","a","r","t","
","C","o","m","p","u","t","e","r"],b3
              x= b3
              gosub send_data
              next
return
'.....................................................................................
Progress_Mesg:

       gosub CLR

              low RS
              x=LINE1+3                                  'center text on top line
              gosub Send_data
              high RS

       for b2=0 to 17
              Lookup b2,["R","e","p","a","i","r"," ","I","n"," ","P","r","o","g","r","e","s","s"],b3
              x=b3
              gosub send_data
       next

return
'.....................................................................................
Complete_Mesg:

       Gosub CLR
              low RS
              x=LINE1+5                                  'center tect on top line
              gosub Send_data
              high RS

for b2=0 to 14
Lookup b2,["R","e","p","a","i","r"," ","C","o","m","p","l","e","t","e"],b3
x=b3
gosub Send_Data
next
return
'.....................................................................................................
       Clr:
                low RS
                outl =%00000001          'Clear the display.
         pulsout E,1
                high RS
       return
'.....................................................................................................

       send_data:
              outl =x
              pulsout E,1
```

```
        return
.....

GETSW_LOC:

if SW2 then SW2_ON_UPD
if NOT SW2 then SW2_OFF_UPD

        SW2_ON_UPD:
                SW2_LOC="B"
        return

        SW2_OFF_UPD:
                SW2_LOC="A"
        return
.....
```

Archive of SAM Projects

This is done using relays, [illegible]

old

Flowchart Description

Figure J90

Figure J90 is an operational diagram of the circuit board shown in Figure Design1_2.ckt]. In Item J90.10 the input selector switch is checked in order to determine which of the three possible operations (A, B, or C) is requested by the user. As denoted in J90.20 if operation A is selected the device branches to operation A. If operation B or operation C is selected, the device branches to either of the respective operations. If none of the operations are selected the device continues to wait for a selection.

Operation A

Upon startup, if the operation input switch is selecting operation A, the device switches the user hard drive BUS Address ID to a number other than 0. At the same time the master hard drive's power is turned on and the drive spins up recognized at ID 0 in place of the user hard drive. This function, as shown in flowchart item J90.40, can use any type of switching device, whether analog or solid state, to switch both the user drive ID and the master drive power. In [Design1_2.ckt] the devices used are electromechanical relays, which are switched with a Darlington transistor pair at the coil input. As shown in [Design1_2.ckt] relays RLY1, and RLY2 switch the 12 volt and 5 volt power connections to the master hard drive. This configuration uses 2 relays but the same task may be carried out using any number or configuration of relays, transistors, or other type of switching device. In another implementation, the hard drive power could have the ground connections all switched in order to turn the hard drive on and off. This implementation is shown in figure W52 [Design1.ckt]. When the master drive power and user drive address are switched, an optional message on an LCD screen (optional, but used in this implementation), appears along with an indicator lamp, which denotes the operation currently executing.

Operation B

Upon startup, when operation B is selected by the input switch, the device waits for X seconds before operation execution. This ensures that the user has time to abort and run under the normal operating conditions. Operation B as shown in flowchart item J90.30 waits for the specified time delay J90.60 and then Resets CMOS J90.110. At the same time an optional indicator lamp (LED B) is illuminated as shown in J90.100 and a message is displayed on the optional user interface (LCD) screen.

Operation C

Operation C is a normal operation mode J90.50 that allows the computing device to startup in a non-repair mode. Besides normal operation a message is displayed on the optional user interface J90.80 (LCD screen), and a normal mode indicator lamp is illuminated J90.90 (LED C)

After the selected operation executes the device loops, in order to check for a change in the operation selector switch. This is shown in J90.140, which performs the same function as J90.10. At this point, if the operation selector switch has not been

Doc 4 pg 5 of 7 Doc 4 pg 5 of 7

"Backup and/or Repair System" – "Multi-User System" – "Virus-Proof/Hacker-Proof System" – "Hardware-Repair System" – "Freeze-Buster System" – "Net-Lock System" – "Entertainment/Communication System" for Computing Devices and Hardware

Invented by Anthony More & Kenneth Largman Version 42601

1. The invention described herein is hereafter referred to as the: "Backup and/or Repair System" – "Multi-User System" – "Virus-Proof/Hacker-Proof System" – "Hardware-Repair System" – "Freeze-Buster System" – "Net-Lock System" – "Anti-Theft System" "Entertainment/Communication System."

2. BACKGROUND AND HISTORY OF INVENTION

2.1 For the past several years we have been developing a new type of computer repair process to enable typical, non-technical, computer users to repair complex computer problems without effort, repair knowledge or skills. Our goal was to provide a way for the computer user to simply flick a switch, push a button, or speak a command, and have the computer take care of fixing itself, quickly, and easily, no matter what was wrong with the computer. We also wanted to be able to protect the computer from damage.

We constructed a prototype switching assembly and installed it in a computer, with the control switch located on the front of the computer to give the user easy access to the switch, and enabled a person to:

• Conveniently and simply push a button, flick a switch, or speak a command and perform our automated repair process. This switching system and related features that we initially developed for the repair process also enabled us to create several derivative inventions.

This switch triggered relays that were used to switch between data storage devices by switching power and/or device identities -- functions that were used by the repair process. We wrote repair scripts and programs to automate the repairs, so that the user didn't need to know a thing about fixing computers. The repair scripts made backups of the user's data storage device, reformatted the data storage device as necessary, and then replaced some or all of the operating system data, and/or other settings and/or data. These repair scripts and programs were loaded onto the prototype, and after a few adjustments, we got the contraption working.

For the first time, in conjunction with a combination of our repair scripts and programs, a user could just turn a switch on their computer and the computer would fix itself. Incidentally, we realized that the same invention we had made for the repair process also provided the ability to easily switch between one or more data storage devices, and also to switch groups of data storage devices. By using the ability to switch between data storage devices, we were able to construct prototypes that had one or more data storage devices dedicated to particular users, and that by turning a switch the computer would be set up for a completely different user. Additionally, this gave us the ability to construct

7004969 2007-04-20

computers that could be used by network administrators to rapidly switch between large numbers of data storage devices, and therefore, more easily create and update templates used in network repairs, perform software installations and "updates" of client computers.

The devices, methods, and technologies we developed for the repair process led to many new discoveries. We realized that many unique inventions could be derived from this technology. For example:

- A device that could automatically backup and/or repair data storage devices and software.

- A way to enable multiple users to share a computer, each having total privacy of data.

- A way to enable a computer to have totally separate and independent and multiple operating systems and unique setups on one computer.

- A way to enable switching between multiple data storage devices.

- A way to enable a computer to switch to an emergency "startup" and/or "operating" device.

- A method of switching data storage devices so as to "quarantine" viruses, block hackers, and protect data.

The repair process evolved. We wanted to be able to enable a user to test and repair more data storage devices and components, and be able to switch to other components in the event of component failure. We decided to develop a computer in which any part and any software could fail and/or become corrupt, and that our invention could fix anything, (hardware or software) that went wrong.

We realized there was a broader spectrum of devices that we could switch, which led to yet other unique inventions that were derived from this technology, such as:

- A way for users to switch from components that have failed to components that function properly.

We also recognized that certain types of devices are prone to causing computer "freezes " that can be resolved by breaking and re-establishing one or more of the connections to that device. Therefore we developed:

• A method of switching the connection to devices off and then back on, as a means to reset the connection and break out of a "freeze."

As we considered the repair process we also wanted to prevent the computer from needing repairs in the first place. One source of computer damage is from viruses and hacking from the Internet. We realized that our switching process could also be used to solve concerns about network privacy and security, and a desire to enable parents to control children's access to the Internet. We decided to use our invention to switch "on" and "off" network and/or communications connections. During this development process we developed:

• A method of switching and/or locking a network/communications connection in the "on" or "off" position.

So we added more switching features, such as giving a user the ability to turn a switch on their computer and switch between entire sets of data storage devices, the ability not only to switch between data storage devices, but also to switch power supply, jumper cable connections, network connections, and any type of circuit or connection, and enabled the ability to reset hardware and software settings. We added the ability to reset PRAM; BIOS; CMOS; CUDA, and any other chip, board, and/or device that stores such information. We then decided to add the ability to switch between a data storage device and a circuit board, and the ability to switch between circuit boards. Then we added the ability to switch remotely, and for the device not only to be on a computer, but on any type of computing hardware. We added the ability to switch between logic boards and entire computing hardware systems, neural networks, etc.

We kept adding more switching functions, until virtually anything on the computing hardware device could be switched locally or from a remote source, and interact with other devices that were local or at remote locations.

Initially we had just given the computer user the ability to perform the switching process by mounting the switch on the computer where it was easy for the user to reach the switch. But as time went on, we added the optional ability for it to be controlled: by a system administrator, other users, by network devices and appliances, automatically, locally, or remotely.

We created optional scripts and programs to enable computers and computing hardware to do new things with the new abilities that resulted from the new switching features. These scripts and programs enabled new methods of: repairing computers, switching

between data storage devices and groups of data storage devices, switching back up systems, reformatting data storage devices, providing for emergency switching of data storage devices and circuit boards and computing systems, recovering data from back-up storage devices, etc.

For example, a user could sit at a computer and flick a switch located on or in the computer to fix a corrupt data storage device (or any device), and be able to flick a switch on or in the computer to change from one device to a different device, such as a logic board and/or ROM chip, and/or network connection, etc.

Here is a different example using our switching system, in conjunction with programs and/scripts, to perform a backup and repair process for a malfunctioning hard drive:

- Two hard drives can be connected to a "regular" computer.
- A single toggle switch can be mounted on the front of the computer, or any location.
- Both hard drives are controlled by our special switching system that can control their "Device IDs" and/or "master" and "slave" settings, and power.
- Hard drive 1 is a "typical computer user's" hard drive with an OS, a few applications, documents, and e-mail. Its device identity is set as the "master" hard drive.
- Hard drive 2 can be partitioned into 3 partitions: a) a "start-up" partition b) a "master" partition and c) a "backup" partition. Partition "a" is configured to be the "booting" partition.
- During "normal" use, our switching system switches hard drive 2's device identity to be a "master" hard drive, but our switching system also turns off hard drive 2's power.
- In partition "a" we have a perfectly functioning OS and related software to control the repair process. In partition "b" we have exactly the same OS and exactly the same applications as on hard drive 1, in a "pristine state" with no "defects". Partition "c" is blank at this point in the process because the machine is new and "backups" have not yet been made.
- A program that copies data from hard drive 1 to hard drive 2 can then execute periodic "backups" of the user's data (e.g. the "My Documents" folder, email) to partition c of hard drive 2. These backups may be uncompressed, compressed, or represented by an algorithm. The program can be stored on any device that can store data (hard drive 1 or a flash ROM chip are two examples).
- This copying procedure can be made possible, for example, by utilizing a program that initiates the switching process (which switches the power "on" to hard drive 2 and gives it the "slave" device ID) at periodic intervals (that could be adjusted by the user) in conjunction with scripts that copy the user's documents and email to the

"backup" partition "c". Each backup that is created may be given a unique time/date stamp so that when the user needs his/her data back s/he can choose from multiple "backups."

Various parts of the OS, application software, or any other data on hard drive 1 could then be damaged, deleted, corrupted, or destroyed. The hard drive could even have "bad blocks" and/or sectors, and/or even physical damage on the surface of the hard drive. The corruption of hard drive 1 could be so terrible that the computer could not even "boot up." We could then repair it:

- "Flip" the "toggle switch" and the following switching process occurs:
- Our switching system then switches the "device ID" settings so that hard drive 1 becomes the "slave" drive, power is then connected to hard drive 2, and hard drive 2 is switched to become the new device ID of "master."
- The script that creates "backups" could then execute again and copy all or selective data from hard drive 1 (for this example, it could copy the user's "My Documents" folder and/or email.) to Partition "c" of hard drive 2.
- Another script could then run on hard drive 2 that would completely reformat hard drive 1. It could also map the "bad blocks" on the hard drive.
- Then another script could run on hard drive 2 that copies the "perfectly functioning" copy of the OS and applications from partition "b" over to hard drive 1.
- Optionally, a script could then run that asks the user which copy of the "backups" from partition "c" the user would like to revert to. Upon choosing a particular backup, the "My Documents" folder and email (from partition "c" on hard drive 2) would then be copied back to hard drive 1.
- When it finishes copying, another new script could run that shuts-down the computer and its hard drives.
- The user could then "flip" our switch again and it would switch the "device ID" back to "master" for hard drive 1, switch hard drive 2 to "slave" and cut its power.
- The user could then restart the computer, and it would boot-up perfectly into the freshly reformatted hard drive 1, with its freshly copied OS and applications, its freshly copied "My Documents" folder, and its malfunctioning behavior would thus be repaired.

We added optional switch locks to the hardware, and scripts and programs were developed to enable multiple users to use a computer with completely different sets of data storage devices, with each user unable to access the others storage devices. The functions of the scripts and programs can also be handled by programs in ROM, programmable logic controllers, circuit boards, and various forms of data storage devices.

Numerous scripts and programs were developed, and we continued to develop the hardware.

In some situations, we soon learned it could be dangerous or cause damage, to turn a switch when power is being supplied to a device, and thus we invented several methods of preventing (or locking) a switch from turning or deactivating the switch when power was being supplied, and releasing the switch (or allowing the connection to be made) when it was safe and power was removed. This dangerous situation can also be avoided by using a logic controller to prevent a switching process from taking place until it is "safe." This would be accomplished by having the controller keep track of power, device identities, etc. and thus control switching as needed.

It then occurred to us that we could trigger various functions very similar to what we had developed via hardware by using software that could be integrated into: data storage devices, ROM, programmable logic controllers, circuit boards, etc., which led to a whole new approach to the repair process. To clarify this, in addition to software triggering the switching process, we found a way to replace most or all the switching process with software, or to use the software switching replacement in conjunction with the hardware switching.

We then developed numerous options for triggering the process, instead of just being limited to a switch we realized it could be controlled via voice commands, via telecommunications, optical control, wireless communications, scheduled events, logic control, etc. We decided to provide optional security over the switching process not only by key switches, but by voice id, retina id, optical recognition id, thumb prints, voice prints, magnetic cards, passwords, encryption, and any type of method available to provide secure identification.

Therefore, we realized that we needed to make our invention work for a wide spectrum of users, no matter what options they wanted. We decided to make our invention scaleable -- expandable as needed -- with modular hardware components that could be quickly connected together if desired, and optional software scripts that could be mixed and matched as needed. Thus, if someone wanted one component switched, our switching system would consist of the switching circuitry needed for that one component and the optional software for that one function could be provided. If a user wanted more components switched, we would have the ability to just snap in additional modular components as needed, and provide the optional software for the additional functions. (Snapping the components together is optional... they can also be mounted as separate non-modular components.). Non-modular versions can also be produced as needed.

We wanted to make these innovations usable for robots, robotic devices, electronic devices, network appliances, vehicles, and all situations where computing equipment was integrated with other equipment and devices. Therefore, we revised the trigger and switching system so that instead of being limited by the restriction of having the switch and/or "trigger" located on the front of a computer (or under an access panel/door of some sort) the trigger and/or switch could be movable so that it could also be located anywhere to give the user(s)/operator(s) easy access. For example, in situations where a computer is used as part of a vehicle, robotic device, etc, the switching system(s) and/or trigger(s) can be located within easy reach of the user(s). It can be built into a dashboard, control panel, robotic control system, control room, house, building, door, remote location, or anywhere else.

We have ended up with a scaleable switching system with scaleable hardware and software and scripts and programs that perform many scaleable functions, that can fit together in modular fashion as needed; as well as, several methods of controlling the switching process.

We also invented electronic connections on the outside and inside of the computer that provide ways to connect lighting, decorations, LCD's, LED's, sound, and or video, to communicate what is taking place, and for entertainment purposes.

We also invented a light emitting/reflecting acrylic device that may also utilize/interact with the other inventions.

Upon evaluating what we had developed, we observed that it can be used to enable one or more functions described herein. Therefore our work evolved into writing this preliminary patent application.

We have attempted to put these inventions/processes/systems into 7 groups. They all utilize a variation of our "switching system" in conjunction with software and hardware. They are:

"Backup and/or Repair System"
"Multi-User System"
"Virus-Proof/Hacker-Proof System"
"Hardware-Repair System"
"Freeze-Buster System"
"Net-Lock System"
"Entertainment/Communication System."

3. How are these inventions different from existing products?

3.1 The "Backup and/or Repair System" - new and unique features:

- Push a button (or other trigger to initiate the switching process) and the computer repairs a corrupt or malfunctioning data and data storage device(s) by executing a process of automatic steps (without technical skills needed by the user.)

- A combination of hardware and software processes that back-up data and can repair data storage devices (for example, automatically re-format a data storage device, and then restores a backup).

- Use of "master copies" (or "templates") of software programs on separate data storage devices for purposes of repair.

- The ability to "start-up" from a separate data storage device as needed to be able to function and/or initiate repairs.

- The ability to back-up data to a separate, internal, protected (because it may be switched or "un-mounted" or locked) data storage device without user involvement in order to enable repairs (such as reformatting) to the malfunctioning data storage device.

- The ability to backup, copy and restore data (and execute scripts and/or programs) so as to repair data storage devices, even if the data storage device is corrupt and "unbootable" by booting from a different data storage device.

- The ability to repair devices that utilize computer equipment without needing to access the computer equipment. Several other new features have been developed and are summarized in the abstracts that follow.

- Ability to utilize and/or be integrated with our other systems.

- Ability to automatically repair any type or model or brand of computing device.

3.2 "Multi-User System" - new and unique features:

- Push a button (or other trigger to initiate the switching process) and the computer switches "device identity" settings for data storage devices so as to enable different

devices to become "startup" devices (for example, to accommodate manufacturer's default requirements for boot sequences).

- Ability to utilize and/or be integrated with our other systems.

- Ability to change device ID settings and/or power connections on data storage devices quickly and easily.

3.3 "Virus-Proof/Hacker-Proof" System - new and unique features:

- A means to automatically switch data storage devices by executing a process of steps (without technical skills needed by the user.) By switching device IDs and/or other means, so as to "quarantine" data, for a period of time, into separate data storage device(s). This allows time for updated virus programs to check for new viruses and "kill" them", and/or so that infected files can be accessed without contaminating the rest of the system.

- Ability to utilize and/or be integrated with our other systems.

- A means to prevent access to data within a computer by shutting off/on network connections as needed (automated) and by only having a data storage device "open" to the network that contain no "user" data or software.

- Automated web-site protection: data storage devices that "host" the data of a web site could be duplicated on many data storage devices and the "cycled" to be connected or disconnect to the network. In this way, "hacked" data could be repaired when it was cycled to the "offline" position, while an "un-hacked" duplicate data storage device could be instantly rotated "online" (switched) to take its place.

3.4 "Hardware Repair System" - new and unique features:

- Push a button (or other trigger to initiate the switching process) and the computer switches from malfunctioning or "failed" components by executing a process of steps (without technical skills needed by the user) to components that function properly.

- Ability to utilize and/or be integrated with our other systems.

- Push a button and the computer switches to a "backup" computer (internal components are all switched at once to duplicate components).

3.5 "Freeze-Buster System" - new and unique features:

- Push a button (or other trigger to initiate the switching process) and the computer momentarily interrupts the connection of a computer peripheral by executing a process of steps (without technical skills needed by the user) so that computer can "recognize" the device.

- Ability to utilize and/or be integrated with our other systems.

3.6 "Net-Lock System" - new and unique features:

- Push a button (or other trigger to initiate the switching process, for example, turn and lock with a key) and the system interrupts the connection of a network/communication connection (for example, the Internet and/or intranet) by executing a process of steps (without technical skills needed by the user) so as to restrict or allow access to said network/communication connection.

- Computers (and other computing devices and/or hardware) don't have built-in switches that can be easily controlled by the user(s) (or by an administrator, or across a network, or wireless, or other method of control) that allow switching on/off of network and/or communication connections. The "Net-Lock System" provides these abilities and comes with optional scripts and programs that enable users to more easily use these new abilities. It also enables high speed automatic switching of network communications connections.

- Ability to utilize and/or be integrated with our other systems.

4. ABSTRACT

4.1 Overall Abstract:

The following did not exist until now: the ability for a user to control the switching process by locking/unlocking a switch on their computer, remote switching as we have developed it, software switching as we have developed it, the many items that our

switching process can control, and our scripts and programs executing in particular orders with specific and unique, and useful results. We combined them into a switching process that provides many new functions.

The unique "Switching System" is an integral part of what enables these new, unique and useful functions to be made possible. The optional scripts and/or programs have been utilized in specific sequences to perform specific tasks in conjunction with the Switching System. The Switching System is more specifically defined in section 7.

The Switching System includes a switching process that can switch one or more of the following: between data storage devices, data storage device ID's (often controlled by jumper cables and/or a "cable select" cable on a data storage device), between power supplies, between jumper connections, etc. It can also reset PRAM; BIOS; CMOS; CUDA, and any other chip or board and/or device that stores such information. Any circuit between any two devices that can be "opened" or "closed" in any combination can be "switched". It can switch indicators (such as LED lights) for activity, power, and identity. It can also, reset hardware and software settings. As needed, it can utilize optional scripts and programs to enable use of these new switching abilities. It can do any of these switching processes in any combination and permutation.

(Please note that that the switching System can be scaled so that it can be used for one or more of the functions described in the following abstracts. It need not be constructed for more than one function, and can be scaled to perform any combination of functions as desired.)

4.1.1 Abstract of Software as a Switch "Replacement:"

Optionally, the "Switching System" can use a software "Switch Trigger" (see definition) replacement. In other words, a program and/or script can initiate the switching process, instead of a person pushing a button (see examples in section 7.1) The software can also replace a mechanical switch.

4.1.2 Abstract of Switch Lock, Bypass, Delay, and/or Cylinder Lock Device

4.1.3 Optional Switch locking mechanisms and switch deactivation mechanisms were developed to prevent damage to computer equipment if someone turned the physical "Switch Mechanism" at the wrong time. The locking mechanisms prevent the "Switch Mechanism" (a physical switch, for example, a "switch-lock") from physically turning when it is not safe to turn the switch. The switch deactivation mechanisms deactivate all

or part of the Switching Process until it is safe to perform the switching process, e.g., when no electrical current is flowing to the devices being switched.

4.1.4 A logic controller can also be used to control the Switching Process and/or power, and/or any other connections and/or settings, so as to prevent damage to computer equipment by deactivating the Switching Process when it is not safe to switch.

4.1.5 Abstract of system Scalability and Expandability:

The Switching System switch can be scaleable and expandable. It can switch one item, device, or circuit, or very large numbers (theoretically infinite numbers) of items, devices, circuits, and/or computing hardware systems. It can be modular, and/or non-modular.

4.1.6 Abstract of Location and Accessibility:

One of the features that makes the each of these systems different, is that there can be a "Switch Mechanism" (see definition) (a physical trigger) readily available to the user, and that the Switch Mechanism can be located anywhere, including on or near the computing device, and/or convenient to the user. For the first time, the devices being switched can be switched easily and conveniently. The Switch Mechanism can be located in easy to reach locations such as the front or side of computing devices, near user controls of robotic devices, on vehicle dashboards, in control rooms, locally, remotely, and/or wherever it is convenient for the user/operator. This enables the user/operator to easily reach a (the) switch(es). The Switch Mechanism can take the physical form of any sort of a trigger; for example, toggle switches, buttons, switches, switch-locks, voice control, retina identification, card readers, magnetic key systems, and any sort of local and/or remote system used for triggering a switching process.

Please note that when switching takes place, it is not necessarily switching to/from devices on the local computing hardware, but may switch to or from devices on a network, and/or global computer network and/or communications network. The "Switch Trigger" may be located separately from the "Switch Mechanism."

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4.2 The "Backup and/or Repair" System Abstract

The "Backup and/or Repair" System consists of copying data, executing scripts, and switching data storage devices for the purpose of repairing data and/or data storage devices.

The "Backup and/or Repair" system consists of a series of software and/or hardware events, that, when strung together in specific order(s), back-up and perform repair functions of data storage devices.

This invention can be built as a computer that contains the features described herein, and/or can be built as independent devices that can be added to or integrated into computers.

4.2.1 The "Backup and/or Repair" system as Used for data storage device repair:

One option is for the "Backup and/or Repair" system to keep and/or utilize one or more perfect master template(s) of the users' data storage devices, and it can back up and archive the user's data using software or scripts [(which can, for example, be located on a StorExecute (see definition)] that "backs-up" or copies data from one data storage device to another. When the data storage device has a "problem," the "Backup and/or Repair" system can use its switching features to access the perfect master template(s), and/or the backup(s) and/or archive(s), and may use some scripts and/or programs [(which can, for example, be located on a StorExecute (see definition)] to restore a computer to a functioning state. Rather than using a master template, the "Backup and/or Repair" system can also conduct the repair from a backup, and/or archive on a separate data storage device.

The following events can take place in variable sequences, and each step is optional, depending on desired results:

- The "Backup and/or Repair" system copies data from a user's data storage device to one or many different data storage devices.
- These other data storage devices would then contain "backups" (or duplicates) of some or all of the user's data.
- After the data is copied, a switching process can then protect the duplicates on the other data storage devices by restricting access to them (for example, by locking and unlocking a series of partitions, or by creating "read-only" files and/or folders and/or partitions.
- Then, if the user's "main" data storage device becomes corrupted, or it fails to "boot-up," a switching process can allow a different startup device to "boot-up."
- The user's data could then be copied BACK to the original user's "main" data storage device; and/or, a different data storage device can copy only the Operating System software, and/or application software to the original user's "main" data storage device.

An optional hardware diagnostic program may execute in conjunction with the switching system to administer repairs on demand and/or self repairs by switching from defective data storage devices to data storage devices that function properly.

Note: The user's own monitor could be used by the Repair System to communicate with the user. For example, a second video card (or other device to process a video signal) may be utilized by the system so that it can display information to the user on the users own monitor.

Alternatively, for example, the system may utilize the existing video card by switching its signal so that the repair system controller can control it and send its own video signal to the monitor (to display repair messages or information to the user using his/her monitor).

4.2.2 The "Backup and/or Repair" system as used for "Emergency Startup" & "Emergency Computing"

The "Backup and/or Repair" system can optionally be used for switching to a separate data storage device for use as an emergency startup system (note: the data storage device may be "on" and always available for instant switching, so that the computer does not require a restart). Thus, when a startup device is not recognized by the computing hardware, and/or at the request of the user, and/or other request from elsewhere, (or automatically when a problem is detected, and/or on a schedule) the "Backup and/or Repair" system can then switch to a secondary startup data storage device and restart, and/or switch between RAID mirror data storage devices, etc.

4.2.3 Abstract of the "Backup and/or Repair" system as Used for Formatting and Device Testing

The "Backup and/or Repair" system can optionally be used to test data storage devices. It can be used to temporarily switch to a data storage device for startup, while a data storage device reformats and/or tests another different data storage device.

4.3 "Multi-User" System Abstract

"Multi-User" System as used to enable multiple users to share a computer, each having total privacy of data:
The "Multi-User" System can be used to enable multiple users to use computing hardware as if each of the users had their own private computer. When a user is using a computer, the "Multi-User System" sets up the data storage device, operating system,

applications, etc. just for that particular user. Then, when a different user wants to use the computer, the "Multi-User System" hides away the previous users data storage device, operating system, software, and data, and provides a different data storage device, operating system, and software for the new user.

4.3.1 Abstract of the "Multi-User" system as used to enable a computer to have totally separate and independent and multiple operating systems and unique setups on one computer

The "Multi-User System" can be used to control totally different setups of operating systems and software, and switch back and forth between them. For example this would enable a computer to be set up with Linux and movie editing software in Japanese, and the "Multi-User System" could then switch the computing hardware to be set up with Windows and mathematics software in German.

4.4 "Virus-Proof/Hacker-Proof System" Abstract

"Virus-Proof/Hacker-Proof System" as used for a method of switching data storage devices so as to "quarantine" viruses, block hackers, and protect data.

By switching data storage device IDs and/or power, and/or network connection, and/or other means, data storage devices can be connected to a computer in such a way that one or more of the data storage devices can be isolated from other data storage devices, and/or isolated from network connections.

Thus, if a hacker or virus were to enter a data storage device that was connected to a network, said hacker or virus could only access one of the data storage device(s) because the other data storage devices were "separated" by the Switching System. This data storage device could be devoid of user data. Incoming data, such as email and/or web downloads could then be transferred to a data storage device that acts as a "quarantine are". After a period of time has passed, and/or virus checks have been run, data can then be safely transferred out of "quarantine" and onto user's "regular" data storage device. In this way, a data storage device could act as a "quarantine" for data. Viruses could then be "killed" in this isolated data storage device at a later time (for example, it would give a user enough time for an anti-virus definition to be written and downloaded for a new virus. This system would also prevent infected files from being accessed without contaminating the rest of the system.

Also, a user could switch from one data storage device that was "private" or "isolated" (by using our switching system) from the network, to a different data storage that was exposed to the network, but was "empty" of user's personal data. Thus, a hacker would

not be able to access the user's private data storage device., but only the one containing no user data.

4.5 "Hardware-Repair" System Abstract

"Hardware-Repair" System as Used for Computer Repair:
By utilizing the Switching System, a user can easily switch from components that have failed to components (and or computing device) that function(s) properly. An optional hardware diagnostic program may execute to determine the status of hardware, and if necessary, switch from defective devices to devices that function properly, (and/or to a secondary computing system) by utilizing the Switching System. Note: The switching of data connections may also occur while electrical power is still connected to the device(s) (see section 7).

4.5.1 Abstract of the "Hardware-Repair System" as Used for Formatting and Device Testing:

The "Hardware-Repair System" can optionally be used to test data storage devices, circuit boards and computers. It can be used to temporarily switch to a data storage device for startup, while a data storage device reformats and/or tests another different data storage device. It can be used to switch to a different logic board, network connection, or computing system. It can test the hardware that was taken out of use. One way it can do this is by switching from the device in-use, to alternate devices that are used while testing and formatting takes place.

4.6 "Freeze-Buster" System Abstract

"Freeze-Buster" System: a method utilizing the Switching System to momentarily switch the connection(s) to devices "off" (not connected) and then back "on" (connected), (or vice versa) as a means to reset the connection and "break out of" a device and/or computer "freeze."

4.7 "Net-Lock" System Abstract

"Net-Lock" System: a method of "locking" a network/communications connection to be either "on" or "off". This method utilizes the Switching System to be able to switch and/or lock a network and communications connection both "on" (connected) or "off" (not connected). The "Net-Lock System" may also contain optional scripts/programs that switch and lock the network and/or communications connection (including wireless).

This led us to another evolution. We realized that companies would want a way of shutting off internet connections, without shutting off their own intranet. So we developed methods for switching from an Intranet connection to a full web connection, and visa versa. This may also be done by utilizing two network connection devices that can be independently switched. This can also be achieved by integrating two network "jacks" (and associated and necessary circuitry/parts) onto one network interface card that can be independently switched.

Thus, if someone wanted one network connection switched, our switching system would consist of the switching circuitry needed for that one connection and the optional software for that one function could be provided. If someone wanted more connections switched, we would have the ability to just snap in additional modular components as needed, and provide the optional software for the additional functions. (snapping the components together is optional... they can also be mounted as separate non-modular components.). Non-modular versions can also be produced as needed.

The "Net-Lock System" can also switch on and off network connections. It can turn off and on (and lock and prevent access to) connections to a global computer/communications network, Intranet connections, and all other types of network connections.

For example, a parent could connect over a global communications network to their home computer and turn off and lock their computer network connection from use... and only they can unlock it.

Optionally, the user can restrictively control the "Net-Lock System" settings. For example, software could provide options such as: who has the right to "lock" or "unlock", when unlocking can occur, (on a schedule, and/or certain hours, etc,) etc.

An optional program/script gives the user/operator locking/unlocking the network and or communications connection. Optionally, this process could also run automatically.

5. Explanations of Terms

5.1 Master Template & Master Template Storage Device & Master Template System

5.1.1 Master Template: A master template is a collection of software that consists of one or more of the following: operating system, applications, or whatever else the user and/or maker of the template wants to put on it, and/or default/user preferences and settings. It is created by copying said software onto a data storage device (or partition) that is defined as a Master Template Storage Device.

5.1.2 Master Template Storage Device: A data storage device and/or partition(s) that is/are used for storing Master Templates. It may exist locally, and/or over a network. Optionally it may consist of more than one data storage device. This may be permanently or temporarily set to "read only" access during the repair process. Optionally, it may also be set to "read-write" access, for example, during an update.

5.1.3 Master Template System: A master template is created, copied, or exists and is stored on a Master Template Storage Device. It may be updated on demand, and/or at specific intervals defined and executed by a program. Data may be installed (and/or optionally copied), thus creating an updated master template.

5.1.4 StorExecute: Any method and/or device for storing and/or executing a program. This can be a logic board, CUDA, EPROM, chip, circuit board, etc.

5.2 Backup & Backup Storage Device & Backup System:

5.2.1 Backup: A copy of data to another data storage device and/or partition. It exists on a data storage device that is defined as a Backup Storage Device. This may be permanently or temporarily set to "read only" access immediately following the backup process. Optionally, it may also be set to "read-write" access, for example, during an update.

5.2.2 Backup Storage Device: A data storage device and/or partition(s) that is/are used for storing backups. It may exist locally, and/or over a network. Optionally it may consist of more than one data storage device.

5.2.3 Backup System: Optionally, "on demand," and/or at specific intervals defined and executed by a program, a backup is created (as needed). Backups may be overwritten on demand and/or based on a computer program that, for example, but not limited to this example, staggers the intervals for creating backups over time, thus creating a collection of backups. Optionally, backups may be created by currently existing programs. Optionally, backups may be incremental, differential, or full. The backup Storage Device may also have multiple partitions that are turned into "read only" partitions immediately after that user's data has been copied there, and could cycle back over the oldest partitions first, after all partitions were filled.

Optionally, the Switching System may switch off the accessibility of the Backup Storage Device (by interrupting power and/or changing device ID settings, or other means) so that

said data storage device is only accessible while backups are being created or restored, and thus hidden from the user the rest of the time.

Several different examples follow:

A program or script runs a "copy" command that makes a full, or partial, or compressed, and/or "normal", and/or encrypted, and/or "read-only" backup of User's data. This can be done by using any one of a number of software backup, or cloning products such as, but not limited to Retrospect; Assimilator; Backup Exec, Ghost, File Wave, etc., or by using a "copy" command, or running a block by block copy of the User's data.

Another Example: Backups could be stored that are: same day most recent, same day next older, same day next older, 1 day old, 2 days old, three days old, one week old, two weeks old, three weeks old, one month old, two months old. As time goes by, obsolete (oldest) backups may be overwritten. They can be made locally, or over a network.

Repair Examples

Example 1: A second operating system runs in the background with hardware and/or software process watchers that watch for a freeze, and/or any type of problem. When a problem occurs the repair process replaces any files and/or data that is different/modified/etc. as needed., resets connections as needed, and may copy and/or reset RAM, information in the processor, etc. as needed, and send a delayed copy of the data to the processor, prior to the last event that may have caused the problem (such as opening of an incompatible application).

2) Example 2: A second and "mirrored" operating system can run on a second processor, and a third another processor (or microprocessor) can run a repair program. The second data storage device can be running in a time delayed mode. When a problem occurs, the process in the second processor is stopped, (before a freeze), the freeze is analyzed, and the processor and ram is set up as they were before the event occurred that may have triggered the freeze.

Alternatively, it could backup in time without necessarily (or in conjunction with) analyzing what went wrong, and see if the freeze occurs again... if so, "back up" further in time... until such time as the freeze does not occur.

Comparative Copying and replacement of files and data.

Master template may be compared to the User data storage device and/or to a partition and/or area of the user data storage device that it needs to repair. Some or all of the data is repaired by copying from the master and replacing software on the user data storage device that is different, changed, modified, or missing. Any items that do not match the template are removed.

Shortcuts, finder flags, aliases, icon positions, folder views, etc. are set to match those needed on the user data storage device. Based on user preferences and/or defaults, particular items on the master template can be marked or selected as items not to delete and/or items not to copy.

The master template may also contain a log and/or database of information to store information, and during the repair process set such items as the volume name, machine name, user name, password(s), which master template to use, which Data Storage Device, and/or partition to use, etc. These may also be adjusted by the user as preferences.

There can be various (and different) master templates to choose from. When one or ones to be used can be selected by the user(s) in preferences. Example 1: a user named "Mary" may use one master template, whereas a user named "Fred" may use a different master template. Example 2: A robotic device should be controlled a particular way in a particular situation. Thus it is using "template A". The situation changes and it is decided that the robotic device should act a different way. A switch may be made to utilize master "template b". Any number and variety of master templates may be utilized. Example 3: In the anti-theft version, the master template can be shifted to be a "bogus" template if the ID check fails. Which user data storage device(s) to repair can also be a "default," and/or a preference, and/or can be modified by an administrator. More than one user data storage device can be repaired.

The master template(s) and data storage device(s) can also be repaired. In this case (a) different master(s) (perhaps on a network) can be used, and the repair process can be similar to the options described herein for the repair process of the user data storage device, except it is the master template(s) and data storage device(s) being repaired.

User preferences can enable a user to select whether only part of a data storage device is repaired, and/or if the entire data storage device is repaired (such as reformatted) but if only some data is replaced, for example, if just the data on "Partition A" is replaced, but not the data on "Partition B".

A sub-master (a subset of a master) can also be used as all or part of the repair process.

In preferences, data on the master can be selected for special attention such as: always replace, never replace, replace if changed, replace if missing, etc.

A database can be used to store preferences, and information about which template to use, which user data to repair, etc.
Example of one embodiment of the repair process: When repair is needed on the primary system and/or data storage device, switch to secondary operating system that may be mirroring and/or having delayed mirroring (and may use a secondary processor and/or protected processing), do repairs on primary system, reboot primary system if needed, switch back to primary system.

The repair process can function in a number of different ways. For example, it can be user controlled, it can always take place on a schedule, and/or on startup, shut down, etc.

The master template may be a "perfect" installation of the system and software and/or data that a user wants and/or is required and/or desired on their computer/computing device, that may also have been checked for conflicts and/or errors and said errors could then corrected by an IT professional.

There are a number of ways to create a master template. For example:
an original "perfect" installation (where errors may have been identified and corrected) can be made on the user data storage device and then copied, or installed, to a second data storage device that contains the master template.
It can be created on another computer elsewhere, and downloaded via a network to reside on the users' computers.
It can be created and/or reside on a data storage device located on a computer elsewhere, and run across a network to repair the users' computer.

It can be created on the storage device and/or partition used to store the master template.

When the master template is created elsewhere and "run", or installed, over a network, or created on a different data storage device than the user data storage device, then shortcuts and/or aliases may need to be modified to work properly when they are copied to the user data storage device. In this case, during the copy process, the code fixes those shortcuts and/or aliases to point them to the correct item on the user data storage device.

If a reboot of the computer is required, this step can be eliminated by copying the startup sequence of the computing device to an EPROM, and keeping it powered "on" when a computer is "shut down". RAM and/or other volatile memory, (and/or a time delay

version of RAM and/or other volatile memory) can also be stored, and copied back as needed.

Optionally, one or more additional switches and/or switch triggers can be utilized by user to confirm the repair process.

5.3 Archive Storage Device:

5.3.1 Same as a backup (5.2), but archives are never overwritten. Often (but not always) the type of media used for making an archive can only be written once.

5.4 Startup Device

A startup device is any device that can be used to "boot" or startup up a computer and/or computer equipment. It may exist on any media, device, and/or circuitry that can perform this function, and can be performed across a network.

(Intentionally no section 6)

7. Switching System:

7.1 Switch Mechanism: a physical switching device or a software switch (which uses software programs) to execute instructions and/or events. If a hardware switch is used it may be mounted on and/or in the computing hardware and/or on devices, control panels, dashboards, remote locations, control rooms, and anywhere.

For example, consider two data storage devices: Device A and Device B. The "Switch Mechanism" (in the form of a physical mechanism) could initiate the change of the device ID of Device A, and change the device ID of Device B. If the devices use jumpers for ID switching, the switching process could switch the jumper(s) on devices A and B to different IDs.

Software can do the same thing. For example, a program stored in a StorExecute (see definition) can be used to tell the computing hardware to "un-mount" Device A and "mount" Device B and treat the identity of Device B as a different ID.

7.2 Switch Trigger: Any method of triggering a Switch Mechanism to initiate the Switching Process. For example: Turning a switch or key, voice command recognition system, optical recognition system, software command, and/or any of a myriad other ways of triggering a switch to occur. The switch trigger can be controlled by the user or

operator locally and/or remotely, across a network, wireless, etc. The switch trigger may be mounted on and/or in the computing hardware and/or on devices, control panels, dashboards, remote locations, control rooms, and anywhere. It may also be initiated in software only.

7.3 Switching Process: The process of using a Switch Mechanism to switch data storage devices to and/or from other data storage devices.

The Switching Process may also use an optional program/script to give the user/operator the choice of which data storage device they want to use. For example, a dialog can be used to give the user the option to choose from an array of several data storage devices. Optionally, this process could also run automatically. This process may include the opening and/or closing of electrical circuits connected to data storage devices, and/or ground connections, and or jumper cable connections, to switch which device "boots" the computing device, and/or switch data storage device identity.

Switching Process: The ability to switch device(s) and/or circuitry to and/or from other device(s) and/or circuitry.

An optional program/script and/or switch(s) gives the user/operator the choice of which device(s) they want to switch. For example, a dialog can be used to give the user the option to switch from "parent data storage device" to "child data storage device"; or offer an array of several data storage devices to choose from; or the user or program can switch to a different logic board or RAM chip, circuitry or computing device. Optionally, this process could also run automatically.

7.3.1 Switching Process: The ability to switch device(s) and/or network and/or communications connections.

7.3.2 The switching of data connections may also occur while electrical power is still connected to the device(s).

7.4 Switching a Data Storage Device:

The switching system may perform one or more of the following functions:

7.4.1. The switching process can change the device ID for a data storage device. For example, in the case of a hardware switch mechanism, in some cases it is a matter of closing or opening the circuit(s) of the jumper(s) for one ID, and not closing/opening other jumper(s) for different IDs. Another example: switching a cable select cable so that the

"master" becomes "slave" and "slave" becomes "master" is another way of switching device IDs.

7.4.2. The switching process can change the device ID for a data storage device in other ways: this could also be achieved by having one data storage device (device "A") set to a particular ID (that is the startup device ID), but with its power switched off. Another data storage device ("B") could be in normal use. Then, when "A's" power is switched "on", this device, along with its ID, becomes "active", thus making it ("A") the new start up device. The ID used by device "B" can be switched to a different ID.

7.4.2.1. The Switching Process can switch data storage device power on and off, thus "hiding" and "un-hiding" the device; switching between making the device inaccessible and accessible.

7.4.3. In the case of software, a program may decide which device to mount and/or which device(s) to treat as active, and which device(s) to treat as inactive.

7.4.4. A software version may execute a program in a StorExecute , which can mount one data storage device and "un-mount" a different data storage device. Additionally, device Ids could be switched in software

7.4.5. Another example of how a software switch could operate is for a StorExecute , to be programmed to give the user and/or operator the choice which data storage devices and/or startup devices to use, and/or be programmed to make scheduled changes between devices in use. A StorExecute , can also change to become the default data storage device(s), unless the data storage device doesn't mount or freeze repeatedly, in which case it can automatically switch to another startup device and/or set of data storage devices.

7.4.5.1 Functionality of Circuit Board

This is but one example of how the Switching System can be controlled.

In circuit board figure W152T:

• A jumper shall control whether the time delay circuit receives power. Thus a jumper can disable the time delay circuit.

• If power is being supplied to power control indicators A, or B, or C, do not allow the board to switch anything, even if power to a power control indicator is changed. For example, if power is being supplied to power indicator A, and then is switched to power

indicator B while power is still being supplied to indicator A, ignore the change and keep the terminals closed that are associated with power control indicator B. Only if power is removed from all power control indicators for a period of 3 contiguous seconds or more, allow the changes in which circuits are closed when power is restored to one of the power control terminals.

• Boards and switches combined must be any of these sizes or smaller (smaller is better):

• The socket shall bypass the circuit board with the neutrals (see diagram of neutral jumper bypass).

• If Circuit A: Wait X contiguous seconds and check to see if power is still on to A. If so, turn on time delay circuit. Leave circuit on Y seconds and then turn off circuit. If power is still on to B, don't run again until such time as power is removed from all controls A and B and C for at least 3 contiguous seconds.

• If circuit C, turn on time delay after X seconds (follow b above) and then turn on 1,2,3,4.

• ID Jumpers 4 and 6 are optional spares.

• For multiple users/operating systems, and/or data storage devices, duplicate the circuitry in the drawing (except for the controller and switch/switch lock... in most cases only one controller and switch/switch lock is needed.

In reference to figure L75:

Please note that this is just one example of the "Backup and/or Repair System" and is a functional design. The integrated "Backup and/or Repair System" Switching System can be integrated anywhere in or on the storage device, and/or integrated into the storage device circuitry.

It can be built with wires and relays, and/or a software switching process, and/or a circuit-board, and/or a logic control device. An optional switch can be used that is separate or integrated into the data storage device.

7.4.6. An optional program/script can give the user/operator the choice of which backup and/or archive they want to use to the repair. Optionally, the backup and/or archive process could also run automatically and/or on a timed schedule.

(Intentionally no section 8)

9. How each System works:

9.1 The Switching System:

Four issues should be clarified when considering the Switching System. The way in which the "Switching Process" is initiated ("Switch Trigger"), the hardware (or software) switch ("Switch Mechanism"), that which is being switched (data storage device IDs, power, etc.), and the location and/or accessibility of the "Switch Mechanism".

A Switch Trigger is used to initiate a hardware or software switching process that enables a computing device to switch between one or more data storage devices and/or partitions on one or more data storage devices; and/or sets of data storage devices (Figure M24). When using a "hardware" switch (i.e., when the "Switch Mechanism" is a physical device, as opposed to software only), the switch can switch power and/or device ID jumpers and switch between data storage devices and/or groups of data storage devices, as needed. Similar results can also be achieved using software instead of, and/or in conjunction with, the hardware version of the "Switch Mechanism".

If a "hardware" switch is used, it may be mounted on and/or in the computer and/or computing hardware and can be controlled in any way switches are controlled, including but not limited to switches, switch locks; voice control; optical recognition, encryption, passwords, etc. The switching device can be controlled by the user or operator locally and/or remotely, across a network, wireless, and/or automatically, etc.

The Switching System takes place as described in section 7. Optional scripts/programs designed for the switching process function can be executed as well. See examples described in section 7.3.6.

9.1.1 Switch Lock, Bypass, Delay, and/or Cylinder Lock Device - How it Works:

The locking mechanisms and switch deactivation mechanisms were developed to prevent damage to computer equipment if someone turned the switch at the wrong time. The locking mechanisms prevent the switch (or switchlock) from turning when it is not safe to turn the switch. The switch deactivation mechanisms deactivate the switch until it is safe to use the switch. Some versions of the Switching System do not require a switch locking mechanism or switch deactivation mechanism.
There are several ways to construct the lock. It could be done with a brake, clutch, tooth, clutch, solenoid, piezo device, etc. Two examples follow:

9.1.2 An optional solenoid, brake, lock, or clutch assembly can be used to prevent a key from turning in the switch lock when power is on. (i.e. figures M20, M21, and M22). This device can stop either the lock cylinder from turning, and/or a rod and/or other attachment to the switch and/or switchlock.

Example: A mechanical rotary cam lock with an extension or mechanical key lock with an extension shaft is mounted so that the knob or key can be turned from the outside of a computer, or can be located behind an access panel that can be accessed easily by the computer user.

Coming from the rear of the cam lock or key lock is a round extension shaft, 1/4" in diameter, for example. The shaft is surround by a brake, such as a friction brake, magnetic brake, or many other types of brakes or clutches that can be used to stop a shaft from turning, the shaft then is connected to a electric switch. These three devices can be separately mounted on a platform, or to make things a bit more compact, they can be combined into one switching device with one housing.

When power is on, power is supplied to:

1) the brake so the switch can't be turned, and

2) power is provided to the input power post of the main electric switch.

Therefore wherever the switch is positioned before the computer is turned on and power is supplied, devices connected to that circuit will get power, and at the same time because the brake is on, the user will be unable to turn the switch to another position until the power is off.

Example: Instead of locking the shaft, the shaft can be eliminated, and the brake/clutch/solenoid/piezo device, etc. can lock the cylinder and thereby prevent it from turning.

Or, another method can prevent damage to the computing device: Option: An "StorExecute" (logic control device, Programmable Logic Controller and/or circuit board) can be used that can perform one or more of the following functions: reset the PRAM, CMOS, BIOS, etc., switches data storage device identities as specified, and switches data storage devices as needed, switches their power as needed, restarts or resets the computer, deactivates switching process as needed, runs computing device as needed, etc. (Note: Switch Trigger can be initiated in myriad ways: the Switch Mechanism does not

need to be physically moved to utilize integrated voice activated control, and control via telecommunications and network access -- built into the circuit board/PLC. This board/PLC, etc., can also delay some switching events as needed, while other events transpire. For example if the user turns a switch the PLC/circuit board may delay that switching process, until it is safe for that event to take place without damage. Board may also deactivate Switch Trigger, and/or Switch Mechanism, and/or Switching Process as needed.

9.1.3 Switching System Scalability and Expandability- How It Works:

The Switching System switch is scaleable and expandable. It can switch one data storage device, or very large numbers (theoretically infinite numbers) of data storage devices. This is done simply by adding or removing switching circuits and control. We have developed modular switching devices than can be used for this purpose.

9.1.4 Location and Accessibility - How It Works:

One of the key features that make the Switching System different, is that there can be a "Switch Mechanism" (see definition) (a physical trigger) available to the user, and that the Switch Mechanism can be located anywhere, including on or near the computing device, and/or convenient to the user. For the first time, the devices being switched can be switched easily and conveniently. The Switch Mechanism can be located in easy to reach locations such as the front or side of computing devices, near user controls of robotic devices, on vehicle dashboards, in control rooms, locally, remotely, and/or wherever it is convenient for the user/operator. This enables the user/operator to easily reach a (the) switch(es). The Switch Mechanism can be easily accessed by any sort of a trigger, for example, toggle switches, buttons, switches, switch-locks, voice control, retina identification, encryption, card readers, magnetic key systems, and any sort of local and/or remote system used for triggering a switching process.

The Switching Process that can switch one or more of the following: between data storage devices, device ID's, power supply from one source to another, and/or on and off, and jumper connections. It can switch indicators (such as LED lights) for activity, power, and identity. It can also reset hardware and software settings. As needed, it can utilize optional scripts and programs to trigger the use of these new switching abilities. Another option, it can trigger a switching process over a network, and/or global computer network/global communications network (for examples see figures L70 - L76, M24).

The Switch Trigger can be used to initiate the switching process that switches between one or more data storage devices and/or partitions on one or more data storage devices;

and/or sets of data storage devices. When using a "hardware" switch trigger, the switch trigger can switch power and/or device ID jumpers to switch between data storage devices and/or groups of data storage devices as needed. The Software Switch can accomplish similar results (see explanation under Software Switch).

9.1.5 Note: Any switching features listed below can be combined with other switching features.

9.1.6 Note: Scripts and programs can be located on a StorExecute. (e.g.: figure W53 and L76)

Figure L76: The series of instructions of these various systems can be integrated into a StorExecute. These methods may utilize software, hardware, and/or a combination of hardware and software. For example, a program can be written into ROM that controls the startup sequence and/or data storage device selected for startup during normal use; and then when a request for repair has been made, the program in ROM can switch the startup device. Additionally, for example, a memory module can contain the master template(s), the backup(s), archive(s), and/or any other software, instructions, and/or code to execute the Switching System.

In the figure L76, L76.1 represents the concept that the switching system can be executed via a StorExecute. It may store and/or execute the some or all of the instructions that may control the entire repair process. For example it can reset PRAM, CMOS, BIOS, etc. settings as in L76.2, it can determine which data storage device will be the startup device, and switch startup devices during the repair process if needed, (it can also perform some types of repair without switching startup devices), it can control backups and archives to a storage device, memory module, a remote location, etc. It can also control communication with the users, manage automatic repairs and processes, including, but not limited to execution of all scripts, switching, programs, etc. It can interact with other logic control systems and devices to conduct, coordinate and manage collaborative repairs with other computing devices using the Switching System.

In the paragraph above, when we use the word "computing device" it is used in its broadest sense... for example, it could consist of biological and/or "nano" computing elements and switching mechanisms.

9.1.7 There are myriad combinations, permutations and variations on how hardware and software switching can be done. The following are only a few examples for demonstrating concepts. A person skilled in the arts can develop numerous variations in short order.

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9.2 Specific Examples:

9.2.1 The "Backup and/or Repair" System as Used for Computer Repair - How it Works:

The "Backup and/or Repair" system can be used to repair computers, and other devices that use data storage devices. One option is for the "Backup and/or Repair" system to keep and/or utilize one or more "perfect" master template(s) of all or some of the user's data stored on their data storage device(s), and it can backup and archive all and/or some of the user's data. When the data on a data storage device, or the data storage device itself has a problem, the "Backup and/or Repair" system uses its Switching Process and the Master Template(s), and/or the Backup(s), and may use a/various script(s) and/or program(s) which can for example be located on a StorExecute, to repair the data storage device(s). Rather than using a Master Template, and/or in addition to using a master template, the "Backup and/or Repair" system can also conduct the repair from a backup, archive, and/or other data storage device(s). (Example: see figures F31 - F44).

Optionally, the Master Template System and/or Backup System, and/or startup device may be utilized to perform their functions as described in sections 5.1 and 5.2. (Example: see figures F31 - F44)

If a decision is made (by user and/or operator and/or program) to repair a data storage device (Example see figures: W51 - W64), then the Switch Trigger triggers the Switching System. Several options and variations on what devices are switched can transpire at this point. This can occur in many variations. The Master Templates and Backups and Archives can exist on only one data storage device or on many different data storage devices in myriad combinations and repair one data storage device, or many.

Optionally, the Switching Process (See example figures S1 - S10, M24 and W51 - W64) can change the startup device to a different startup device that is connected to the computing system hardware either locally or via a network. Upon starting ("booting") from this new startup device, and/or upon switching to another logic control device, a program that may reside on this new startup device, and/or a logic control device, and/or StorExecute, may execute and display a list of various options, for example, methods to "fix" the data storage device that is in need of repair, and/or update Master Template.

An optional program and/or script may also execute (or give the user a dialog box offering the user to select) functions to be performed such as: user may choose to reformat the data storage device that needs repair ... and/or the user may choose to execute a low level

or quick reformat of the data storage device, or the user may choose to skip the reformatting process. When choice is selected, the function is performed by a program that executes that function, e.g., reformatting software is run.

Optionally, the user may also be asked if he/she wants to copy all or some of the data that exists on the Master Template data storage device(s), and/or Backup data storage device(s), and/or Archive data storage device(s), to the data storage device(s) that need(s) to be repaired. If this choice is selected, then the same type of program that was used to make the backup(s) could also be used to copy and/or modify the data from the Master Template back to the user's data storage device, thus making the data storage device used by the user (nearly) identical to the Master Template. (There may be some variations made to the data on the repaired data storage device as needed-- for example, shortcuts and/or aliases may need to be modified to point to their targets correctly).

Optionally, a program and/or script may also execute (or give the user a dialog box asking the user to select) any of the following functions to be performed: copy data from one data storage device (from a particular date or partition) to a different data storage device, as needed. For example, the same type of program that was used to copy User Documents, Email, Bookmarks/Favorites, Quicken data and/or preferences, etc. to the Backup Storage Device, can now reverse its process and copy all or some of the data back to the user's data storage device that needed repair. (A script may be executed that gives the user the choice of which backup (e.g. from which date) to copy the data).

Optionally, a program and/or script may also execute (or give the user a dialog box asking the user to select) any of the following functions to be performed: modify data, and/or perform ANY instructions ("de-fragment", virus scan, re-partition, etc.) that affect ANY data storage device that is in need of repair and is accessible/available to the computer system locally or across a network.

Upon successful completion of the repair process, a program and/or script may execute that causes the Switching Process to select the original "startup device," and the repaired data storage device can continue to operate normally.

The Master Template System and/or Backup System, and/or original data storage device may continue to be utilized to perform their functions.

The "Backup and/or Repair" system Switching System is utilized as described in section 7. Optional scripts/programs designed for various other functions can be combined as well.

9.2.2 In reference to figure TW 169:

This is another example of one method of an optional automatic repair script/program:

Upon computer startup, a script/program can hide all activity that occurs in the background. During this time, a logo and text or other information and/or graphics may be shown to user. This text and logo could be able to be modified by the user. Optionally, this "hiding" function can be toggled off/on at any time by keyboard input of a password and/or use of (a) "hot" key(s) by the user.

Optionally, a program or script could run the following sequence of events (all in the background hidden from the user):

A backup and/or archive program could be run that makes a complete backup and/or archive of the data on the data storage device that is normally used (e.g. at device ID 1). The destination of this backup and/or archive could be able to be modified in user preferences. For example the backup/archive could go in a partition or folder on the drive at ID 0, or could go on a drive at ID 2.

Optionally, a program or script executes that checks to see that the backup has been made successfully. After confirmation that backup is complete and successful, user can be given an optional dialog (that can be modified by client) allowing user to select one of the following options: (ID 1 is used as an example) no format of ID 1, quick format of ID1, low level format of ID1. Optionally including complete deletion and recreation and/or re-write of all partitions, master boot records, etc. (Background could remain hidden) Optionally, this dialog only shows up if selected in preferences. In lieu of this dialog, preference can be selected by the user as to which type of format is performed or not performed.

Optionally, if user is given the option in "user-preferences," based on user selection, quick, or low level, or no format is run on ID1. Otherwise whatever default option is in preferences is done. Optional script then executes a program that copies some (not all) data on ID 0 to wherever data belongs on ID 1. For example this script may copy such items as: Explorer Favorites, Netscape Bookmarks, E-mail, in box, out box, and address book. Optional: LED and/or computer screen can provide a dialog box that says something like: please turn switch to "Normal Use" position. Optional: LED and/or computer screen can provide a dialog box that says something like: "please restart computer". Or those events can happen automatically, with or without dialog. Optionally, all the events described above can also be written into a StorExecute.

9.2.3 Another example of controlling the repair process. See figure TW169

• An optional time delay circuit can be integrated that allows the PRAM/CMOS/CUDA, etc. to be reset prior to performing the rest of the repair process.

• Optionally, a controller can reset PRAM/CMOS/CUDA/BIOS, etc.

• Optionally, a logic control device can delay switching between data storage devices until restart, and/or can avoid restart by use of switching control to another logic control device, and/or can conduct repairs without restarting.

• Optionally, a second processor and OS can run in the background so that switching for repairs does not require restarting.

Please Note:

In all wiring and circuit board diagrams, only the material are illustrated, and it will be understood that they are not drawn to scale.

9.2.4 The "Backup and/or Repair" system as used for Repairing Several/Many Data Storage Devices, Multi User Repair:

The repair process can be used to repair multi-user computing devices, and/or device with multiple data storage devices using the same techniques as described herein for single data storage devices.

9.2.5 The "Backup and/or Repair" system as used for Emergency Startup - How it Works:

The "Backup and/or Repair" system can be used for switching to an emergency startup system and/or device. When a startup system and/or device can't be seen, and/or at the request of the user, and/or other request from elsewhere, the "Backup and/or Repair" system can switch to a secondary startup system and/or device, and/or to switch between RAID mirror data storage devices and/or systems. The "Backup and/or Repair" system Switching System is utilized as described in section 7. Optional scripts/programs designed for various other functions can be combined as well.

9.2.6 The "Backup and/or Repair" system as used for formatting and device testing - How it Works:

The "Backup and/or Repair" system can be used to test data storage devices. It can be used to temporarily switch to a data storage device for startup, while a data storage device reformats and/or tests another different data storage device. It does this by switching from the data storage devices in-use, to alternate logic control and/or data storage devices that are used while testing and formatting takes place.

9.3 The "Multi-User System" as Used for Multiple Operating Systems and/or Software - How it Works:

The "Multi-User System" can be used to have totally different setups of operating systems and software, and switch back and forth between them. So for example this would enable a computer to be set up with Linux and movie editing software in Japanese, and the "Multi-User System" could then switch the computing hardware to be set up with Windows and mathematics software in German.

9.3.1 The "Multi-User System" as Used for Multiple-Users - How it Works:

The "Multi-User System" can also be used to enable multiple users to use computing hardware as if each of the users had their own private computer. When a user is using a computer, the "Multi-User System" sets up the data storage device, operating system, applications, etc. just for that particular user. Then, when a different user wants to use the computer, the "Multi-User System" hides away the previous users data storage device, operating system, software, and data, and provides a different data storage device, operating system, and software for the new user.

9.3.2 The "Multi-User System" as used for Switching Between Several/Many Data Storage Devices - How it Works:

Data Storage Device Switching: "Multi-User System" can also be used for rapidly switching between many different data storage devices such as those used on computers. Please note that if the data storage devices are set up as bootable startup devices, then the "Multi-User System" can switch rapidly between startup data storage devices.

9.4 The "Virus-Proof/Hacker-Proof System" - How it Works:

A "Network accessible" data storage device defined:

A network accessible data storage device could usually be switched partially or completely off, and/or the network connection could be switched off, and/or the network accessible data storage device could be "un-mounted." The network accessible data

storage device could: 1) only be mounted and/or connected to the network, and/or turned on, when used for sending and/or receiving data on the network; or 2) could always be network accessible; or 3) sometimes be network accessible.

Optionally, the network accessible data storage device could be limited to containing only non-sensitive software, and/or outgoing data waiting to be uploaded or sent.

Optionally programs could exist on the network accessible data storage device that enables mail to be sent and/or received, but not opened.

The program could: unlock and/or open network connections, send and/or receive mail, upload and/or download data, close network connections, mount and or turn on, and/or connect to another data storage device, send downloads and/or mail received to another data storage device.

Quarantine data storage device

A Quarantine data storage device is utilized in the transfer of data back and forth between isolated segments of a computing device. Data may be copied from the "Internet Accessible" and/or "Temporary" data storage device to and from the Quarantine data storage device and then into the protected user data storage device as needed to isolate/protect data. Optionally, after being held in quarantine for a period of time, data can be checked with the latest virus checker before being copied to the protected user data storage device.

Additional information

If any computer on the network detects a virus and/or starts missing data, it notifies all nodes on the network and a preset protocol of response takes place that may consist of one or more of the following: all nodes on the network make backups; all nodes download most current virus checker; all nodes check themselves; backup schedule for all nodes may increase, etc.

Multiple communication cards with various identities may be used to switch identities and send/receive data. A computer send/receive function may be set up like a shell game, where the identity is changing rapidly, and the data storage device is on-line for as short a time as possible... just long enough to send and/or receive, and then it is taken off line. Rather than using a separate drive for viewing data, software would not allow viewing until drive was off line... then before going back on line, software would transfer all data except outgoing data to quarantine.

A program may also synchronize (or copy on a time-delayed schedule) emails (and or other files) that were sent and/or received from the "Temporary" data storage device to the "Quarantined" data storage device, as needed.

(Optionally, data on a data storage device (and associated computing hardware that determines date/time) may be "duplicated" onto a different data storage device with one significant difference: it could be set to use an "older" date/time setting so that if a "date-triggered" virus is present it would not trigger on the "older date" data storage device.)

9.5 The "Hardware-Repair System" as used for Emergency Computing - How it Works:

The "Hardware-Repair System" can be used for switching to emergency backup computing when a computer fails due to hardware problems. The "Hardware-Repair System" can switch to a secondary computing device, and/or to switch between computing components

9.5.1 The "Hardware-Repair System" as used for formatting and device testing - How it Works:

The "Hardware-Repair System" can be used to test computer hardware components, circuit boards and computers. It can be used to temporarily switch to a data storage device for startup, and then tests hardware components. It can be used to switch to a different logic board, network connection, or computing system, while it tests the components that were taken out of use. It does this by switching from the devices in-use, to alternate devices that are used while testing and formatting takes place.

9.5.2 Software Switch Replacement - How it Works:

A software switch replacement can use a program that performs many of the same functions as a switch.

For example, imagine two computers: Computer A and Computer B. A hardware switch could be used to turn off Computer A, turn on Computer B, and switch jumper(s) on a mirror data storage device on B to ID 0.

Software can do the same thing. For example, a simple program in ROM or elsewhere can be used to tell the computer (or computing device) to switch computing devices and use a mirror of the data storage device.

Software can select which computer circuit boards, devices, components, and hardware to utilize.

9.6 The "Freeze-Buster System" - How it Works:

The "Freeze-Buster System" includes a switching process that can switch and reset connections to devices. To do this it switches on/off one or more wires that run between the device and the computer/computing device. It can be used to switch any connections such as data, and/or power, and/or ground. It can switch one or more devices. It can also switch indicators (such as LED lights) for activity, power, and identity. As needed, it can utilize optional scripts and programs to enable use of these new switching abilities. Another option, it can switch local computing hardware, and/or switch over a network.

For example, imagine that an external "hot-swappable" data storage device is attached to a computer. "Freeze-Buster System" can be integrated into the device, or put inline, or on the computing device. It switches the connection to the device off/on as needed to break out of a freeze, and/or reset the connection.

Freeze-Buster can be used to reset connections with external and internal devices.

9.7 The "Net-Lock System" - How it Works:

The "Net-Lock System" includes a switching process that can switch one or more of the following: network and communication connections. It can switch indicators (such as LED lights) for activity, power, and device identity settings. As needed, it can utilize optional scripts and programs to enable use of these new switching abilities. Another option, it can switch local computing hardware, and/or switch over a network, and/or global computer network/global communications network. (for example see figures L70 - L74, M24.

A program and/or script may also execute (or give the user a dialog box asking the user to select) functions, for example, but not limited to:

- Lock/Unlock Network and/or communications connection.
- Setup remote lock and unlock preferences
- Schedule lock and unlock times
- Create or modify list of users who are authorized with lock/unlock privileges

9.7.1 Network Privacy and Security - How It Works:

The "Net-Lock System" can also switch on and off network connections. It can use the "Net-Lock" switching system to turn off and on (and lock and prevent access to) connections to a global computer/communications network, intranet connections, and all other types of network connections.

9.8 The Entertainment Center System as Used for Computer Repair - How it Works:

The Entertainment Center consists of electrical connections, holders, fittings, etc. on the inside, outside, and/or integrated into the body of a computing device that provide the ability for the user (or manufacturer) to hook up anything they want that may interact with the computer and provide entertainment, education, artistic value, etc. For example the outside of a computer can be covered in part, or completely with electrical connections that allow a user to attach devices. Examples:

Example 1: Flashing lights plug into a device that is attached or is itself the computing case. User can change where lights plug in. Lights interact with all switching events and/or with the user(s)

Example 2: A model and/or robot (or robotic device) modeled/constructed in the likeness of a person and/or animal and/or creature and/or thing and/or device, with computer built in Example: Robot that appears human, holding flat screen monitor, sits cross legged on users desk. Wireless keyboard option. Speech, movement, vision, etc. can be integrated into this robotic device. As part of the interface with the computer, the robot can explain what is happening, and discuss events taking place on the computer, work performed by the user, daily news, information gleaned from the internet, ask questions about how the user is feeling, etc.

Example 3: It can be used for art projects, education, entertainment, can consist of any creative use a user wants to make of it. For example, it can be an aquarium, or a hamster house, (in which case attachments can monitor and interact with the pet, and give user feedback. (i.e.: number of cycles a hamster has run on a wheel, etc.) It can be used for educational projects, anything at all. The idea boils down to this: A computer/computing device, does not need to look like a computer. It can have electrical connections and methods of attaching things that enable a user to do anything creative and constructive with the outside of the computing device. Events taking place in the computer can interact with components attached to the computer, and/or in communication with the computer. Components attached to the computer, and/or in communication with the computer can interact with the computer and information can be exchanged, processed,

controlled. The computer can control the attachments, and/or the attachments can interact with the computer.

Example 4: The entertainment center can have switches that turn things off/on and interact with the computer

Example 5: The entertainment center, that is connected to and/or houses the computer/computing device, can look like anything. Whatever someone wants to create. And any artistic endeavor.

Example 6: Entertainment center: Can use interactive modular devices, modular components that fit together, and/or non-modular components.

Example 7: The entertainment center can utilize and/or interact with any form of modular and non-modular devices that can plug into it. People can create whatever fantasy they like. Any sort of modular and non-modular kits can be built to be utilized with the entertainment center and for any purpose such as education, entertainment, games, science, robotics, chemistry, art, lighting, whatever.

Example 8: The entertainment center can run and/or be integrated with a biosphere, terrarium, garden, food dispenser and/or diet control device that may provide food on a schedule.

9.9 Method of Creating Custom Cables and Connections

Figure W177 description

A method of constructing new types of cables and/or connectors to enable switching.

"A" is a cable utilizing a new type of connector "B". The view of B is a top or bottom view. In this example 3 of the wires need to be switched, so the cable has been manufactured with 3 of the connections split. For example connection "N" is connected on one side to the cable, and the other side is plugged into a hard drive, but the connection between the two sides leads to separate pin outs on the cable, (in this example they are located at the top or bottom of the cable). These pin outs can then be connected to wires or a cable that is then attached to a switching device with switches the connection(s).

Example J below is similar to the connector above, but it is not built into a cable. Two cables could be plugged into each end of it, or a cable could be plugged in one end, and the other end could be plugged into a data storage device for example.

Example K is a top or bottom view of a connector in which each of the wires is switchable, and diagrams L and M shows side views of the same connector. The connections in these special cables and/or connectors can be male and/or female.

The switching process can be controlled manually, and/or by a logic control device.

F shows a switch with optional logic controller which can be plugged into standard cables and connectors, and that can switch one or more of the connections.

Please note that these new type of connectors don't need to have the new pin or connectors at the top or bottom, they can be located anywhere convenient. They can be any shape and/or side, and be designed for any type of cable.

Alternatively, the wires themselves can be routed directly to a switch (and back) as needed. Thus, cable A can have one or more of the wires routed directly to the switch as wires and/or as a cable.

This can be used to switch any type of cable, for example, it is possible to switch device ID, read/write, power, perform cable select switching, switch hardware devices, individual components, etc.

Figure W179 description

Figure W179: The one or more wires in a cable can be cut and go to a switch. This can be used to switch any type of cable, for example, it is possible to switch device ID, read/write, power, perform cable select switching, switch hardware devices, individual components, etc.

9.10The inventions described herein can be mixed and matched as needed

9.11Anti-theft system: The Anti theft system can contain one or more of the following: cellular phone technology, a global positioning system a transmitter/receiver, a meaning of identifying the user, and an extra data storage device, logic control, and a switching process. Using all or some of these devices it can use any means of identification to identify user. If user does not match authorized user the following

events can occur:
1) User data storage device is switched off and is thus "hidden"

2) A "bogus," but normal looking data storage device is switched "on," and mounts (optionally id may be switched). It may optionally have a hidden partition that is protected from being erased. Software executes that may be hidden and/or misnames, and/or otherwise would not draw attention from the user and sends out machine location to for example, police, owner's e-mail address, a security service. Information can also be transmitted using any type of transmitter, example: cellular phone call, and/or be sent over a network and/or the internet. The anti-theft process could also be triggered by a phone call.

If user identity doesn't match authorized user, the device may hide the user data storage device, switches to "rigged" data storage device, and also may turn on a global positioning system transmitter to identify location of computer.

When the location of the computer is identified, it can be tracked, even if it is moving.

9.12A combined repair system:

The hardware repair system can be combined with the other parts of the invention to provide a unique combination of repair functions. For example, if the hardware repair system included all of the features described herein, the combined inventions would provide a computer that could repair any software and hardware problem, be immune to hackers, be extremely virus proof, provide entertainment, interface, artistic, and educational features, etc.

In one example, the Self Repairing System utilizes two processors, and can use two discrete computing systems (with an optional shared data storage device, and/or mirrored data storage devices and/or quarantine data storage device(s) that may be integrated into one box) and can be combined with the hardware repair system.

Combined hardware & software repair example: If a second computing process is utilized, repairs can happen on the fly, perhaps without notice by the user, and/or with little interruption to the user. An integrated secondary backup computing system can always be "up and running", with the ability to automatically detect a problem, switch to the backup system, and conduct software repairs on the fly, and/or conduct repairs from the backup system, without bothering to switch the user to a secondary system (unless needed) because the repair process can be so fast the user may not even notice a problem. For example, a freeze occurs. The secondary system can detect the freeze, reset

connections, replace defective software components, and clear and reset devices as needed, so fast that the user may never notice that a freeze took place

The repair process can (optionally) utilize a comparative process that compares the software on the user data storage device to a perfect Master Template. By monitoring user processes, we can monitor the state of the user template, be aware of changes (optionally, have a database of changes and/or differences between the user data storage device and the master data storage device) and rapidly repair the user data storage device (on the fly) as needed based on that database, reset connections, and reset memory if needed.

As an option, system does not need to discard (and/or overwrite) user documents, email, etc. so if there is a freeze or corruption problem only the system software, and/or offending software that is having a problem can be repaired, and just those components that are different from the master can be replaced.

9.13 Optionally, the user operating system and/or applications, and/or data and the Master Template, and repair process can be run in volatile memory, enabling a fast repair process to perform much more quickly, especially if a comparative repair process is used that repairs problems as they occur. Thus, if a "process watcher" is used to detect a problem, the fast repair process can happen so quickly it may not even be noticed by the user.

9.14 Another version of the web site repair process is to use the repair process to repair the web site on a continuous basis during use, and/or optionally switch to other web servers during the repair sequence. Thus, a web site can always be kept in "perfect" condition. If the anti-virus/anti-hacking system is integrated, it could also prevent hacking past the web site. In this case, for example the web site could reside on the data storage device accessible to the network and/or internet, but all other data on the web server would be isolated, not connected to the network, and therefore "un-hackable."

Optionally, an integrated logic control device can reject additional users and close the site down for repairs when defects in the site are detected (during the process of comparison with the master template). To do this, during the repair process, when it is noticed that files and/or data is changed, modified, and/or different, the software then sends a command to the logic controller to reject further hits to the web site, (and optionally disconnect web site users), and conduct repairs as needed.

9.15 All of the inventions herein can be integrated into any device that utilizes a computer and/or computing device, such as televisions, radios, network appliances, machinery, vehicles, etc.

9.16 Net-lock and Freeze-buster can be internal and/or external devices. Either of these devices could lock into place using any sort of locking system and/or holder and/or retaining mechanism and/or device.

9.17 In Anti-virus/Anti-hacker can switch back and forth between a "side" of a computer connected to the internet, and a "side" that is isolated from the internet, by use of a hardware and/or software switching process.

9.18 Dual network connection cards (and/or multiple "cards") can be controlled by a single switch and/or switching process.

9.19 Net-lock can be triggered by software and can be a software switch, without use of hardware.

Page 43 of 69 - 6/9/2004

DIAGRAMS

S

The diagrams that begin with "S" represent the concepts of what we are switching, and that power, ground wire(s), device ID(s), startup order, data, etc. may be switched, and may bypass the switch as needed. They represent circuitry that could optionally bypass the switching mechanism; for example: power and/or ground and/or data (including via SCSI, Firewire, USB, IDE, and all other types of data communication). We assume someone skilled in the arts can use a bit of common sense here.

Please note that data storage devices, switch triggers, etc. in diagrams can be "local", or utilized over a network.

In the figures S1-S8, the circle with an X in it represents the switching process. The lines to the circle with the x show what is switched, and lines that go around the outside of the devices, (and not to the switch) represents the concept that the data does not need to get switched (but it can be switched).

Any combination of the 5 V and/or 12 V and/or ground and/or other power may be switched, either individually, or in combination. It is possible to switch the jumper cable connections that determine the boot order upon system startup. These connections are indicated on Figure S1 by the letters (a) (b) and (c).

Also, ground wires have not been shown, because anyone skilled in the arts can hook up ground wires (or interrupt them).

Data storage devices shown in these drawings can be hot swappable, "local", or located on a network.

When computing equipment is used with any other type of device(s) (for example: robots, robotics, transports systems, televisions, telecommunications, manufacturing, equipment control, etc.) the Switching System switching system and/or switch trigger can be relocated, and/or additional switches and/or switch triggers added, so as to easily provide accessibility users and/or people controlling the system. Additionally the switch mechanism and/or trigger can be camouflaged or hidden as needed. Location appearance, and type of switch can be changed as needed.

S1: Example of Backup and Repair System: the Switching System (S1500) is used for repair of one or many data storage device(s) (S1150) switched via connection (b), and connected to computing system hardware (S1100) via connection (f). Master(s) and backup(s) reside on one or many data storage device(s) (S1700) connected to the computing system hardware via (g) and

Application - Client's Ref.

switched via connection (a). Electrical power, and/or ground wire(s) and/or jumper cable connections, and/or any connection that determines the boot order upon system startup, may all be independently or collectively switched by the switching process. These various connection types are indicated on Figure S1 by the letters (a), (b) and (c) and can be switched by the switching system (S1500). In the event that ID switching is used, the ID of the startup device can be switched to a different ID, and another data storage device can be switched to the default startup device position.

Optional PRAM, CMOS, CUDA, BIOS, EPROM (or other memory storage module and/or device) reset is indicated in box (9202) and controlled by the switching system (S1500 via the connection (d) and powered by connection (e).

S2: Example of Backup and Repair system Switching Process as used for repair of one data storage device. Master and backup on separate data storage devices, with archive.

S3: Example of Backup and Repair system Switching Process as used for repair of two or more data storage devices. Optional startup device.

S4: Example of Backup and Repair system Switching Process as used for repair with other processes such as switching circuit boards, chips, devices, device identity, data storage devices, circuitry, global positioning transceiver & transmitter anti-theft and positioning system, computing hardware systems, ROM, backup storage devices, identity indicators, remote trigger and/or switch, and any StorExecute (see definition).

S5: Example of Multi User System as used for switching between multiple operating systems, software setups, storage devices, and/or circuitry, and or templates.

S6: Example of Backup and Repair Switching System as it is used for repairing multi-user and/or multi-use use, (such as parents and children.)

S7: Example of Backup and Repair process as used with many data storage devices and/or startup devices and/or circuit boards.

S8: Example of Backup and Repair Switching System as used for emergency startup and/or operation.

S9: Example of Hardware-Repair Switching System as used for switching between computing devices. Thus, if one computing device fails, it is simple to switch to a secondary computing device. S9110 optional combined hardware represents the concept that such items at keyboard, mouse, monitor, etc. can be shared, or seperate.

S10: Example of BAR system Switching System as used for switching data storage device identity. A relay and/or switch can be used to break and connect jumpers as needed to change device identity.

S11 Switching process with dual computing devices and ability to switch data storage devices.

S12 Examples of Switching System triggering methods: switch trigger (a) triggers the Switching Process (b).

S13 Switching process for the purpose of isolating data so as to protect data from malicious code and/or "hackers" that are "snooping" via a network connection.

S14 Switching Process switching computing hardware devices in order to isolate and protect data and to include the repair ability of figure S1.

S18 Switching Process controlling dual/isolated computing systems for the purpose of isolating data (so as to protect data from malicious code/un-authorized network "prying eyes" ("hackers).

S19 Switching Process switching computing hardware devices in order to "repair" the computing device, e.g. the ability to switch from a "failed" device to a "backup" or "redundant" and "functioning" device

S20 Example of switching a network connection "off" or "on" and then back again.

S21 Example of the ability to interrupt a connection to a connected computing device for the purpose of "resetting" or "unfreezing" a connection and/or device.

S22 Example of isolating/protecting data by switching data storage devices and network connections.

S23: Example of various "systems" capable of being integrated with one another in a interconnected (optionally modular) manner. Note: each "system" can be "mixed and matched" selectively with other "system(s)" to function independently and/or dependently.

F

The diagrams that begin with "F" are flowcharts.

F20: This example shows the switching process between data storage devices. The switching process switches to a different startup device and/or group of data storage devices.

For example: User is using data storage device "A", then triggers the switching process, and device "A" is deactivated, and device "B" becomes the new startup device.

"A" and "B" can each represent one data storage device, or an entire group of data storage devices. Although the diagram only shows switching between A – G, there is actually no limit to the number of devices it can switch. Please note that: a user, schedule, or event may trigger the switching process.

F31-F44: Diagrams F31 through F44 are considered to be one continuous flowchart extending over seperate pages.

F31: Example of sequence of events including optional backup, archive, Master template creation/update

F32: Example of sequence of events including: switching startup devices; reset of PRAM/CMOS/CUDA, BIOS, EPROM (or other memory storage module and/or device) etc.

F33: Example of sequence of events including options offered to user.

F34: Example of sequence of events including more options offered to user.

F35: Example of sequence of events including method of virus checking.

F36: Example of sequence of events including backup and archive of data.

F37: Example of sequence of events including options for user to run various types of repairs.

F38: Example of sequence of events including options for user to select startup device.

F39: Example of sequence of events including options for user to select automatic repair preferences.

F40: Example of sequence of events including options for user to select type of data storage device format.

F41: Example of sequence of events including an example of repairs performed based on preferences.

F42: Example of sequence of events including backup/archive and options for user to select which backup or archive to "revert to".

F43: Example of sequence of events including update of master template.

F44: Example of sequence of events including options for user to revert to prior bookmarks, E-mail, and other items.

F50: Switching Process occurring without shutting the computing device down and restarting by utilizing two or more processors (and/or "protected processing") and two or more memory devices (and/or "protected/segmented" memory).

F51: By isolating data, potentially malicious code (e.g. viruses) cannot destroy other isolated data because it does not have access to the "protected" data.

F52: The Switching Process (5210) isolates data (5220) that exists on or in computing devices.

F53 Examples of the types of devices where data can exist (and thus isolated).

F54 Example of booting into different data storage devices for the purpose of isolating data on different data storage devices.

F55 Example of isolating data in volatile memory by "flushing" volatile memory, or "emptying" its memory, before and after switching to different data storage devices.

F56 Example of isolating data in volatile memory by utilizing two discreet volatile memory devices when switching between different data storage devices.

F57 Example of isolating data in volatile memory by switching between discreet "segments" of a single volatile memory device when switching between different data storage devices.

F58 Example of isolating data in processors by utilizing two discreet processor devices when switching between different data storage devices.

F59 Example of isolating data in a processor by switching between discreet "segments" (or "protected" addresses) of a single processor device when switching between different data storage devices.

F61 Example of the Switching Process (6110) occurring so as to physically switch "on" or "off" (by "breaking" or connecting the circuit/wiring) power connections (6120) and/or data connections (6130) of a network connection device (6140) as utilized by a computing hardware device (6150).

F62 Example of the Switching Process (6210) occurring so as to "logically" switch data connections of a network connection device (6240) by ignoring data (6220) or by ceasing to process the data (6230). A computing hardware device (6250) typically utilizes network connection devices.

F63 Example of a "brief" Switching Process (6310) occurring so as to physically switch, momentarily, from "on" to "off" and then quickly back to "on" (by "breaking" or connecting the circuit/wiring) power connections (6320) and/or data connections (6330) of a peripheral computing device (6340) as utilized by a computing hardware device (6350), for the purpose of "resetting" the device.

F64: Example of switching system connected to a computer that is connected to a network (e.g. a web server connected to the Internet) and many data storage devices (a, b, c, d, e, f -- could be many more). Switching system "cycles" between data storage device so that only one data storage device is utilized (online and connected to the network) by the web server at any given moment. Note: data storage devices may also be "repaired" (see figure S1) by repair system (while not connected to the web server) if they become corrupted or "hacked" (defaced).

F65: Example of a Switching System that "records" data from one memory device to a second memory device so that if memory in first memory device is deemed to cause undesirable events in the processor, the user can "revert" to the code/data that was executed before the undesired event occurred, thus allowing computer (and/or user) to avoid the activity that caused the problem the first time.

F66: Example of Switching System used as an Anti-Theft device to protect a user's private data. Optionally, it may verify ID as method to trigger Switching System. Optionally, system may send a signal to identify the computer's location.

F90: One example of the direction that data is allowed to "flow" from one device to another.

The diagrams (Examples: Figures 200.1-200.5, 201, 90) are meant to represent the concepts of what we are switching, and that power, device ID, network connection, data, etc. may be switched, and may bypass the switch as needed. They represent circuitry that bypasses the switching mechanism such as power when it is not switched, ground, data (including via SCSI, Firewire, USB, IDE, and all other types of data communication). We assume someone skilled in the arts can use a bit of common sense here.

F200.1 – F200.5: Flow chart of step-by-step scenario for process of protecting data from virus and hacker attacks.

F201: Devices the computing device switches.

W

Wiring Examples:

Circuit Boards: Figures starting with the letter "W" show relays and wires which we used for building prototypes. We have not duplicated the drawings into their circuit board versions because anyone skilled in the art can perform the same functions via circuit boards.

Please note that data storage devices, switch triggers, etc. in diagrams can be "local", or utilized over a network.

We have used relays and wires in the drawings, but assume that anyone skilled in the arts can convert relays and wires to circuit boards.

Data storage devices shown in these drawings can be hot swappable, "local", or located on a network.

When computing equipment is used with any other type of device(s) (for example: robots, robotics, transports systems, televisions, telecommunications, manufacturing, equipment control, etc.) the switching system and/or switch trigger can be relocated, and/or additional switches and/or switch triggers added, so as to easily provide accessibility users and/or people controlling the system. Additionally, the switch mechanism and/or trigger can be camouflaged or hidden as needed. Location appearance, and type of switch can be changed as needed.

In most of these diagrams the 5 V and 12 V power can optionally be switched, but in most cases both can be switched, but it is only necessary to switch one or the other.

Also, ground wires have not been shown, because anyone skilled in the arts can hook up ground wires.

W40: Example of Switching Process switching the data storage devices for the purpose of repair. This is accomplished by switching power and jumper lds to change the startup order of said data storage devices.

W51: Multi-User computing system, with data storage device identity switching, PRAM, CMOS, CUDA, etc. reset, Switching System repair process, and use of brake, clutch, circuit board, programmable logic controller, etc.

At W5110 the circuit board/PLC can time delay the sequence of events so that the reset relay (for example see W5117) is triggered first, and then after

Apple v. Pepper
IPR2019-01690
Ex. 1008
Page 4 of 9

completion of reset, the rest of the switching process continues. Thus, if PRAM, CMOS, etc. is corrupt or set for a different startup device, it will be cleared prior to the next steps. Also, optionally after reset, a program or script can be run that sets the startup sequence and/or resets PRAM/CMOS, etc. to predetermined settings.

W52: Single User with repair.

W53: Repair and backup of Multi-User and/or multi-use system, and PLC and/or circuit board, and reset of PRAM, CMOS, CUDA, etc. Also, example of modular approach to backup and repair process. The same wiring and circuitry methods can be duplicated over and over for more users/more devices.

W55: Repair and backup of Multiple Data Storage Devices. Shows repair, backup, and individual switching of power and device identity. Please note that the device identity switch could be the type that is usually on the back of external SCSI devices that can be switched from 0 -6 or the type that can be switched from 0 - 15, or other switches that can perform switching to multiple identities. Also, example of modular approach to backup and repair process. The same wiring and circuitry methods can be duplicated over and over for more users/more devices.

W56: Repair and backup of Multiple Data Storage Devices. Shows repair, backup, and individual switching of power. Please note that device identity is not switched in this version. A version can also be constructed that has some of the devices switched, and some not switched. Also, it is an example of a modular approach to the backup and repair system. The same wiring and circuitry methods can be duplicated over and over for more users/more devices.

W57: Repair of Multiple Data Storage Devices. Repair on separate busses.

W58 Repair of Multiple Data Storage Devices utilizing hot-swap drives.

W59: Switch used for switching computers, computing devices, computing hardware. Thus, if one hardware device fails, just switch to second device. Please assume that switch W5911 can utilize the brake, PLC, circuit board controls shown in many of the other figures.

Optionally do not switch ground. Optionally, isolate ground from other computing device(s).

W60: Single user, with repair, with switch to secondary computing device and common mirror. Continued on W61.

It should be mentioned that on diagrams 60 and 61 and other diagrams that use shared computing hardware, that optionally ground wires can isolated, and/or

Apple 1004, p. 1998 of 4969

switched as needed to isolate each of the computing devices. Surge and voltage protection and filtering can also be added between the data storage devices and computing devices.

W6060 can be a switch or a relay. In diagrams W60 and W61, instead of using two relays for the master, one relay can be used if the wires from CPU A and B are isolated power coming from the power supplies. For example when CPU "A" is on it won't effect CPU B if B is isolated. The device can also be constructed without isolating the power, and without any switch or relay although that construction method is not recommended.

W61: Single user, with repair, with switch to secondary computing device and common data storage device mirror. Continued on W60.

W62: One computer and/or computing device containing two computers and/or computing devices with mirror and ability two switch between devices. The computing devices can be set up with multi-user, repair, etc., but with common mirrors and ability to switch between computing devices. This system can also be built as separate units instead of combined in one box.

W64 represents examples of wiring diagrams for interrupting connections to computing devices. The diagram shows four examples of this: A, B, C, and D. This is a functional diagram only. Additional wires can be added and switched as needed. Interrupting connections can also apply to switching wireless connections. The connection is briefly interrupted for the purpose of "resetting" the device.

W64NL represents examples of wiring diagrams for turning network connections "off" and "on". The diagram shows four examples of switching a network connection: A, B, C, and D. This is a functional diagram only. Additional wires can be added and switched as needed. Can also switch wireless connections.

W64.6 Example of interrupting connections to an external device to reset connection and/or for the purpose of resetting a device, connection, or to "break" out of a "freeze."

W65 Example of computing device containing dual computing devices that can be switched, plus a shared data storage device (that can be switched back and forth between the dual computing setup) for the purpose of isolating data (so that malicious code cannot affect other data).

W66: Repair of a Multi-User System.
Assumptions about circuit board:
If there is no power to circuit board when computer is shut down:

EDS-4668-0234-002

Circuit board won't operate and can't break CMOS circuit. In this situation it is best to just bypass circuit board and only break CMOS circuit when key is in momentary position.
If there is power to circuit board when computer is shut down AND if there is no power to logic board in shutdown mode:
Circuit board can be used to break power to CMOS prior to computer startup.
If there is power to circuit board when computer is shut down AND if there is power to logic board in shutdown mode:
Circuit board can NOT be used to break power to CMOS prior to computer startup.
Circuit board can be used to send "zap PRAM" keyboard sequence to logic board on startup.

W67 Similar to W65 but also shows how data can be further isolated: a network connection can be switched to ensure isolation of data. For example, the network connection can be switched "off" whenever data storage device (6215) is "on" and the network connection can be switched "on" when data storage device (6214) is "on" (and vice-versa). This "Virus-Proof/Hacker-Proof" computer is a computer that uses one (or more) data storage devices for normal use, and a different data storage device(s) for doing E-mail. The Switching System switches between the data storage devices, alternating between "active" and "inactive" data storage devices. To move data from the E-mail data storage device to the hard drive, or visa versa, a temporary "quarantine" data storage device is used. Optionally, it will not release data until an on-line connection has been made and the drive checked with a current virus checker. Data can optionally be held for a time period, and then released upon a virus check.... giving data virus companies time to detect new viruses and update their software.

Software can be used to replace the Switching System switch or in conjunction with the Switching System switch.

Optionally, the Switching System switch can leave a network connection "on", and switch "off/on" a separate connection to the internet/global computer and communications network. Or both the network connection and connection to the Internet can be switched separately

W68 Circuit Board and Socket Assembly Option

W152T: One type of circuit board for Repair and Backup

1) circuit 1
2) circuit 2
3) circuit 3
4) circuit 4
5) circuit 5
6) circuit 6

EXHIBIT 1006 - PAGE 0134

7) circuit 7
8) circuit 8
9) circuit 9
10) circuit 10
11) circuit 11
12) circuit 12
13) circuit 13
14) circuit 14
15) circuit 15
16) circuit 16

17) circuit 17
18) circuit 18
19) circuit 19
20) circuit 20
21) Power Control Indicator #21
22) Power Control Indicator #22
23) Power Control Indicator #23
24) Power Control Indicator #24
11) 25) Power Control Indicator #25
31) Power Control Indicator activity light for #21
32) Power Control Indicator activity light for #22
33) Power Control Indicator activity light for #23
34) Power Control Indicator activity light for #24
35) Power Control Indicator activity light for #25
26) time delay circuit
27) Data and power to LCD screen
and/or data for computer monitor
and/or to computer.
28) Power to board
50) time delay jumper
51) controller

In circuit board figures W152T:

A jumper shall control whether the time delay circuit receives power when the time control knob that activates power turns the power on. Thus a jumper can disable the time delay circuit.
Supply power to the switch common from the board power supply
Determine whether computer has power based on input from power cable.
If power is being supplied to power control indicators A, or B, or C, do not allow the board to switch anything, even if power to a power control indicator is changed, unless power is off to power input. For example, if power is being supplied to power indicator A, and then is switched to power indicator B while power is still being supplied to POWER INPUT, ignore the change and don't

switch power to B. Only if power is removed from power input for 3 seconds or more, then switch to A, or B, or C.
The socket shall bypass the circuit board with the neutrals (see diagram of neutral jumper bypass).
A = Normal Mode
B = Repair Mode
C = Zap mode

If switch is at A, don't change anything.
If switch is at B, turn on
if someone hit on button while zap is happening we are shot.

If Circuit A: Wait X continuous seconds and check to see if power is still on to A. If so, turn on time delay circuit. Leave circuit on Y seconds and then turn off circuit. If power is still on to B, don't run again until such time as power is removed from all controls A and B and C for at least 3 contiguous seconds.
If circuit C, turn on time delay after X seconds (follow b above) and then turn on 1,2,3,4.
ID Jumpers 4 and 6 are optional spares.
For multiple users/operating systems, and/or data storage devices, duplicate the circuitry in the drawing (except for the controller and switch/switch lock... in most cases only one controller and switch/switch lock is needed.

W153: One type of circuit board for Multi User System

TW160 One type of Circuit Board for Repair and Backup.

Optional Automatic Repair Example Script/program: On computer startup the script/program hides all activity that occurs in the background. During this time a logo and text is shown to user. This text and logo should be able to be modified in preferences. This "hiding" function can be toggled off/on at any time by keyboard input of a specific keys sequence: e.g. while the command key is down, sequential input of the letters: zappy

A program or script runs the following sequence of events (all in the background hidden from the user):

A backup program is executed that makes a complete backup of the data on the drive at ID 1. The destination of this backup should be able to be modified in user preferences. For example in could go in a partition or folder on the drive at ID 0, or could go on a drive at ID 2.

A program or script executes that checks to see that the backup has been made successfully. After confirmation that backup is complete and successful, user is given an optional dialog (that can be modified by client) allowing user to select one of the following options: no format of ID 1, quick format of ID1, low level

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format of ID1. (Background remains hidden) This dialog only shows up if selected in preferences. In lieu of this dialog preference can be selected in preferences as to which type of format, or lack thereof, is performed.
If user is give the option in preferences, based on user selection, quick, or low level, or no format is run on ID1. Otherwise whatever option is in preferences is done. Optional script then executes a program that copies some (not all) data on ID 0 to wherever they belong on ID 1. For example this script may copy such items as: Explorer Favorites, Nets cape Bookmarks, E-mail, in box, out box, and address book. Optional: LED and/or computer screen can provide a dialog box that says something like: please turn switch to "Normal Use" position. Optional: LED and/or computer screen can provide a dialog box that says something like: "please restart computer". Or those events can happen automatically. Optionally, all the events described above can also be written into ROM or the operating system.

TW 169 One type of Circuit Board for Repair of Multi-User System Option.

An optional time delay circuit can be integrated that has a circuit that is normally open. It can have two user controllable time delays controlled by knobs ranging from 5 seconds or less - 60 seconds or more. One time control knob shall control the amount of time until the circuit is closed. The second timer control knob shall control the length of time the circuit is open. A jumper shall control whether the time delay circuit receives power when the time control knob that activates power turns the power on. Thus a jumper can disable the time delay circuit.

If power is being supplied to power control indicators 1, or 2, or 3, or 4, do not allow the board to switch power, even if power to a power control indicator is changed. For example, if power is being supplied to power indicator 2, and then is switched to power indicator 4 while power is still being supplied to indicator 2, ignore the change and keep the terminals closed that are associated with power control indicator 2. Only if power is removed from all power control indicators for a period of 3 contiguous seconds or more, allow the changes in which circuits are closed when power is restored to one of the power control terminals.

Boards and switches combined must be any of these sizes or smaller (smaller is better). The socket shall bypass the circuit board with the neutrals (see diagram of neutral jumper bypass).

Power Control Indicator 1: When power is supplied to power control indicator #1: provide power to time delay circuit if jumper A is on. After time delay circuit has finished and power off for that circuit, provide power to input terminals 1, 2, 3, 4, 5, 6, 7, 8, 10. (not 9)
Power Control Indicator 2: When power is supplied to power control indicator #2: provide power to input terminals 3, 4, 6, 7, 8, 9, 10 (not 5)

Power Control Indicator 3: When power is supplied to power control indicator #3: provide power to time delay circuit if jumper A is on. After time delay circuit has finished and power off for that circuit, provide power to input terminals 11, 12, 13, 14, 15, 16, 17, 18, 20 (not 19)
Power Control Indicator 4: When power is supplied to power control indicator #4: provide power to time delay circuit if jumper A is on. After time delay circuit has finished and power off for that circuit, provide power to input terminals 13, 14, 16, 17, 18, 19, 20 (not 15)

Single User only uses power control indicators #1 and #2.
Please note: boards contain optional spare circuits that can be eliminated.
Please note: knobs for delay start and stop are temporary for the prototype and will be replaced with non-adjustable components after further experimentation with length of time for delay circuit.
Only the material portions of the circuit board and socket are illustrated, and it will be understood that is not drawn to scale.

W175: Example of Net-Lock system as external "add-on" device for network communications device (such as a network interface card, or modem, or other device) and a network. The data signal is redirected via the net-lock device to a switchlock (or other switch trigger) where the connection to the network can be locked "on" or "off" (wire circuit for data "opened" or "closed").

W176: Example of cable connections being "redirected" through Switching System to enable switching each and/or all connections to either a state of "connected" or "disconnected" so as to change, for example, Device IDs, power, read/write abilities, data flow, lock/unlock status, etc. An optional logic controller is indicated to control the process as needed. Without a logic controller, switching could be controlled by, for example, a physical "toggle" switch.

W177: Detailed example of cable connections being "redirected" through Switching Process to enable switching each and/or all connections to either a state of "connected" or "disconnected" so as to change, for example, Device IDs, power, read/write abilities, data flow, lock/unlock status, etc. An optional logic controller is indicated to control the process as needed. Without a logic controller, switching could be controlled by, for example, a physical "toggle" switch.

W178: Example of Entertainment/Communication System utilizing modular blocks that "snap" into one another and thereby connect the wires that are embedded inside each block ("connectors"). Thus, by connecting blocks, circuits can be formed to create effects or functions (such as, for example, but not limited to, an LED and/or LCD and/or robotic device, connected via blocks, to a power supply).

W179: Example of cable connections being "redirected" through Switching Process (in this example without using "wire connectors" as shown in W176) to

enable switching each and/or all connections to either a state of "connected" or "disconnected" so as to change, for example, Device IDs, power, read/write abilities, data flow, lock/unlock status, etc. An optional logic controller is indicated to control the process as needed. Without a logic controller, switching could be controlled by, for example, a physical "toggle" switch.

WJ1: Example of Switching Process switching jumper IDs so as to change the boot order of the attached data storage devices.

WJ2:

WJ3:

M

M20: Example of a Switching System that utilizes a brake on the lock cylinder to prevent cylinder from moving when power is present.

M21: Example of Switching System that utilizes solenoid or piezo switch to stop lock cylinder from turning when power is present.

M22: Example of Switching System that utilizes either a brake, clutch, lock, piezo device, or solenoid, to prevent a rod from turning. The rod goes from a mechanical key or rotary switch to an electrical switch.

M23 shows that the switching can be done on a circuit board represented by M2370, and switch by a switch and/or switchlock M2301. This Example of the Switching System that utilizes a programmable logic controller and/or circuit board to control one or more functions: for timing of switching, reset of PRAM, CUDA, CMOS, etc, control over switching, control over power, connection to network(s) for switch triggers and commands over network(s), control over switches and relays, control over circuit boards, control over global positioning system/security system, control over selection of startup device, control over switch triggering.

M24 shows that the switching can be done by any sort of switching device and/or switch trigger.

We have used a simple switch in the drawings, but assume that anyone skilled in the arts can also diagram the switch into a circuit board if so desired, so that the switching function can stand alone on a circuit board, or be integrated into other circuitry.
This is an example of the Switching System triggering methods.

L

The diagram figures that begin with the letter "L" are examples to demonstrate that the switch(es) can be located anywhere, and on a wide range of devices, inline, and in wireless situations.

When computing equipment is used with any other type of device(s) (for example: robots, robotics, transports systems, televisions, telecommunications, manufacturing, equipment control, etc.) the switching system and/or switch trigger can be relocated, and/or additional switches and/or switch triggers added, so as to easily provide accessibility to users and/or people controlling the system. Additionally, the switch mechanism and/or trigger can be camouflaged or hidden as needed. Location, appearance, and type of switch can be changed as needed.

L70: Example of switch(es) located on computing hardware.

L71: Example of switch(es) located on computing hardware.

L72MU: Example of switch(es) located on robotic device.

L72 NL: Example of switch(es) located on robotic device.

L72S: Example of switch(es) located on robotic device.

L73: Example of switch(es) located on vehicle.

L73FB: Example of switch(es) located on vehicle.

L73MU: Example of switch(es) located on vehicle.

L73NL: Example of switch(es) located on vehicle.

L74: Example of switch(es) located on robotic device.

L75: Switching system integrated into data storage device. Please note that this is a functional design. The integrated Switching system can be integrated anywhere in or on the storage device, and/or integrated into the storage device circuitry. It can be wired and/or wireless, and an optional switch can be used that is separate and/or integrated into the data storage device itself.

L76 Switching System integrated into a StorExecute (see definition).

L76.1: Switching System integrated into a StorExecute (see definition).

Page 59 of 94 - 2007

L76CD: Switching System integrated into automatic CD burner that can create multiple burned CDs without user interaction.

L81: Front view of Switching System mounted in case.

L81FB: Front view of Switching System mounted in case.

L81MU: Front view of Switching System mounted in case.

L81NL: Front view of Switching System mounted in case.

L83: Examples of LCD screen dialog.

L83MU: Examples of LCD screen dialog.

L84 Example of ability to disconnect a network connection with switch trigger mounted on vehicle dashboard.

E

E1: Front View: Optional clear case sitting on top of computing device for housing components described herein.

E2: Side view: Optional clear case sitting on top of computing device for housing components described herein.

E3: Two versions of front View of acrylic block lit by LED or other lighting source.

E4, E5, E6, E7: Optional top and/or sides and/or back of computer/computing device/peripheral device with optional lip. The dots represent electrical connectors for providing electrical current.

E8: Clear case surrounding computer/computing device/peripheral device.

E9: Clear case surrounding computer/computing device/peripheral device. Optional area for liquids and pipes, wires, etc.

E10: Optional top and/or sides and/or back of computer/computing device/peripheral device. The dots and lines represent electrical connectors for providing electrical current.

E11 and E12: Plugs into E-10 on one side, and is connected to E12 on the other side. Main circuits are shown on E11, and can be routed by software to pin outs on E12.

E80: Optional acrylic (or similar plastic) lit by LED lights to indicate the state of the switch. Optionally it can also be used as a decoration triggered by sound, motion, etc. Various colored lights are used to change colors in acrylic. Other art pieces can also be put in these "entertainment" boxes, such as lava lights, plasma lamps, and various art projects.

E81: Optional top and/or side panels of computing device case with positive and negative connections.

E82: Optional Colored or clear Transparent Acrylic Case Lit by LED or other light source. A layer of white acrylic or similar material can be under the outer layer for the purpose of diffusing the light. Optionally, case can be clear and change color when computer functions change when different groups of colored LEDs go on depending on switching functions taking place, or sounds, motion or other triggers. LEDs can be hidden in bottom of case, which can be surrounded by colored material.

Apple Inc. Exhibit 1005
IPR2014-00454

Backup & Repair	Freeze-Buster	F[illegible]ware Repair	Virus-Proof Hacker-Proof	Net-Lock	Multi-User	Entertainment/ Communication
E14	F63	L70	F200.1	F61	F20	E1
E83	L70	L71	F200.2	F62	F50	E10
F31	L71	L72	F200.3	L70	F64	E11
F32	L72S	L73	F200.4	L71	F66	E12
F33	L73FB	L74	F200.5	L72NL	L70	E14
F34	L74	M20	F201	L73NL	L71	E2
F35	L81FB	M21	F50	L74	L72MU	E3
F36	L84	M22	F51	L81NL	L73MU	E4
F37	M23	M23	F52	L84	L74	E5
F38	M24	M24	F54	M23	L75	E6
F39	S12	S12	F55	M24	L76CD	E7
F40	S21	S19	F56	S12	L81MU	E8
F41	S23	S23	F57	S20	L83MU	E80
F42	W64	S9	F58	S23	M20	E81
F43	W64.6	W153	F59	W175	M21	E82
F44		W59	F64	W64.5	M22	E83
F50		W60	F90	W64NL	M23	E9
F64		W61	L76CD		M24	S23
F65		W62	M20		S10	W178
L76		W179	M21		S12	
L76.1			M22		S18	
L76CD			M23		S23	
L81			M24		S3	
L83			S10		S4	
M20			S11		S5	
M21			S12		S6	
M22			S13		S7	
M23			S14		W153	
M24			S18		W169	
S1			S22		W51	
S10			S23		W53	
S12			W65		W55	
S18			W67		W56	
S2			W68		W57	
S23			W176		W58	
S8			W177		W66	
W152T			W179		W68	
W160	W176				W176	
W170	W177				W177	
W40	W179				W179	
W52						
W58						
WJ1						
WJ10						
WJ2						
WJ3						

Table of Which Diagrams Go With Which Invention Embodiments

application/pdf 6884/2007

Figure S1 Sheet 1 of 47

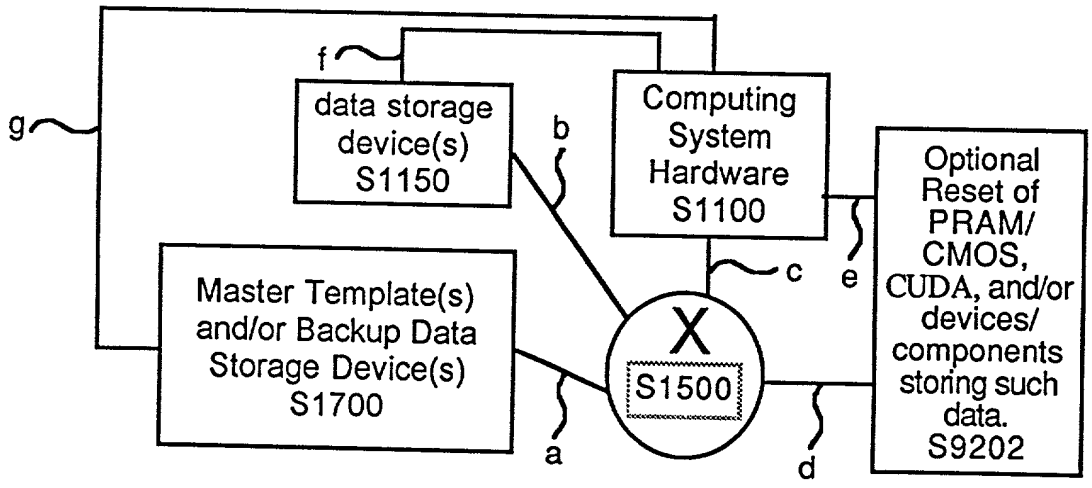

Figure S2 Sheet 2 of 47

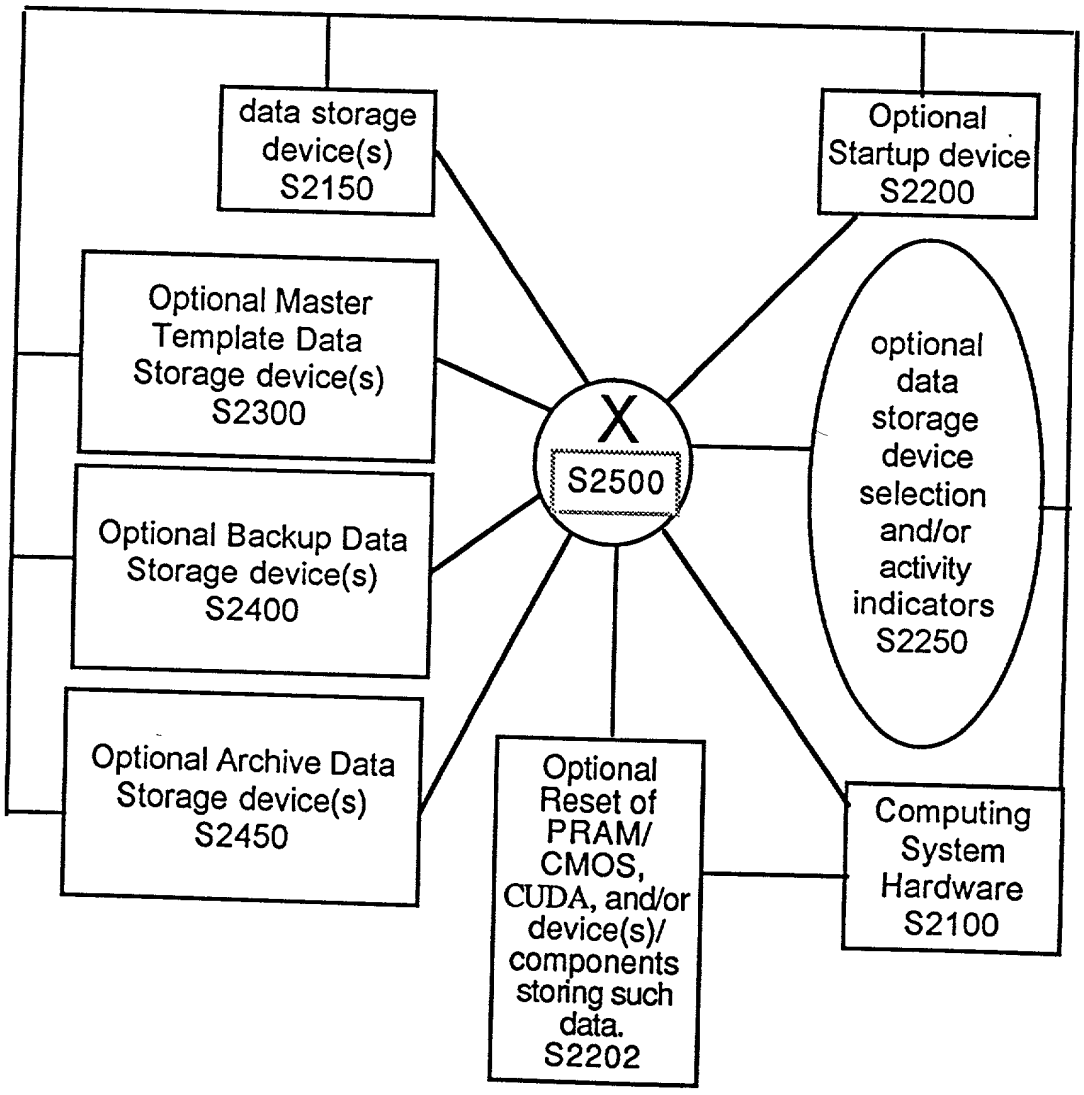

Figure S3

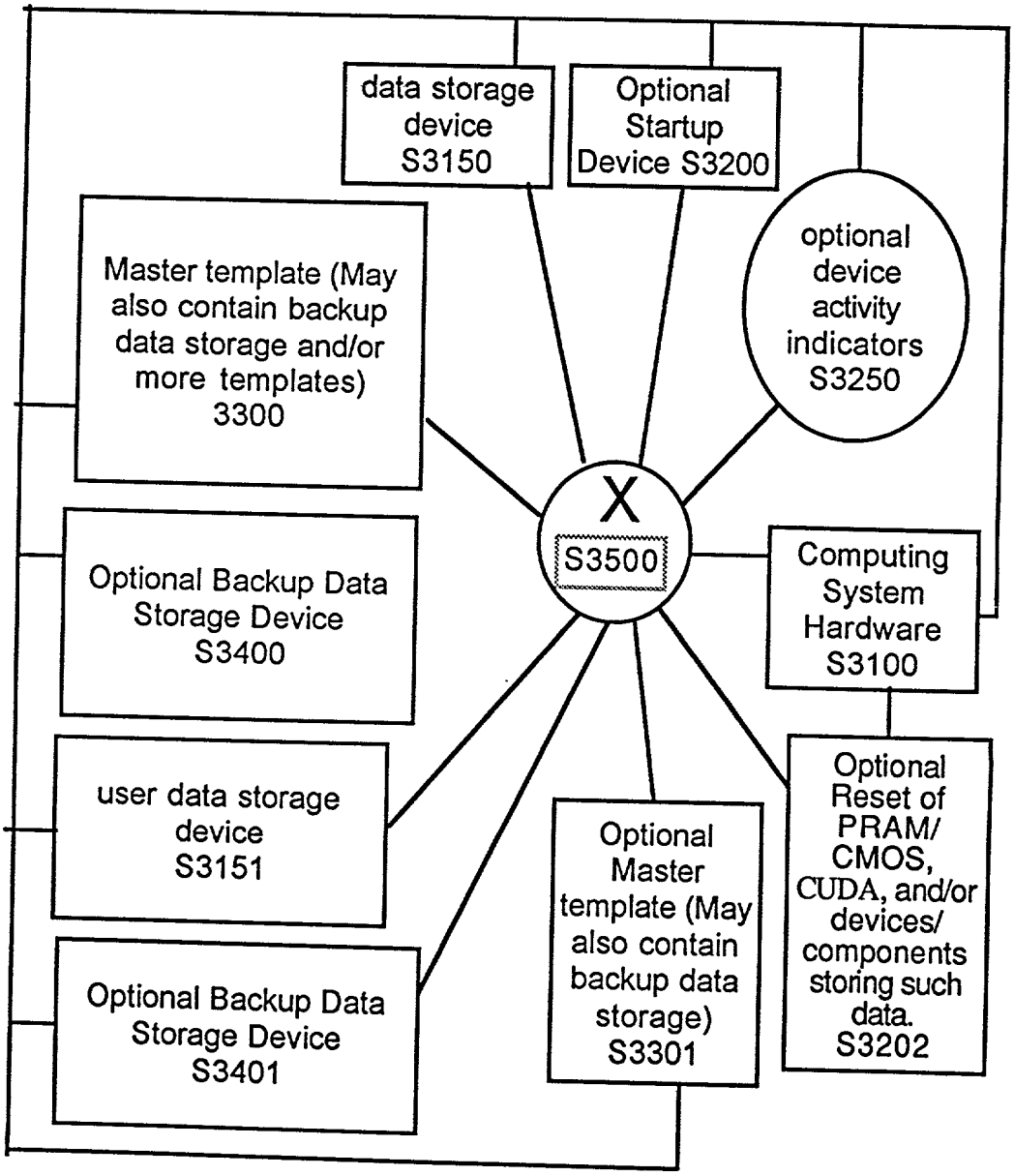

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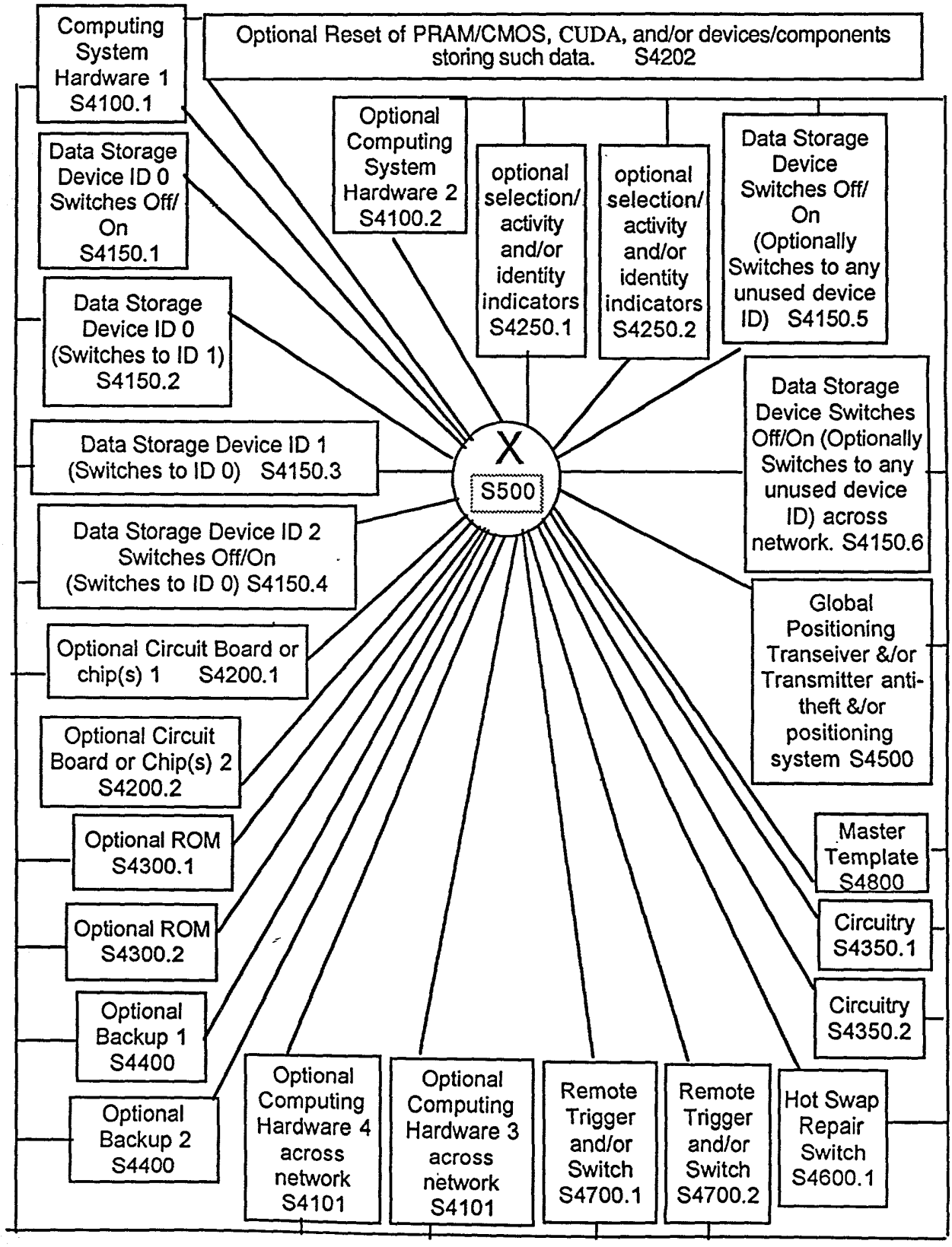
Figure S4



US 7,765,625 B2

Sheet of

Figure S5

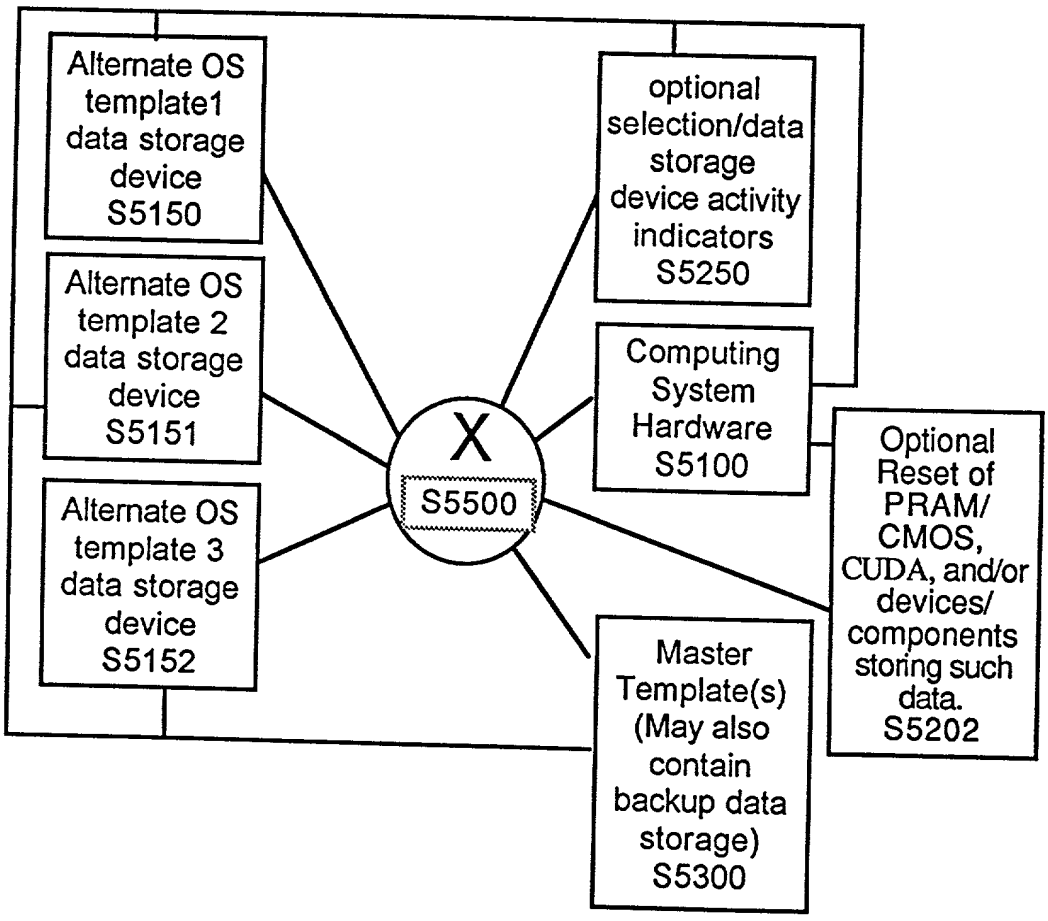


Figure S6

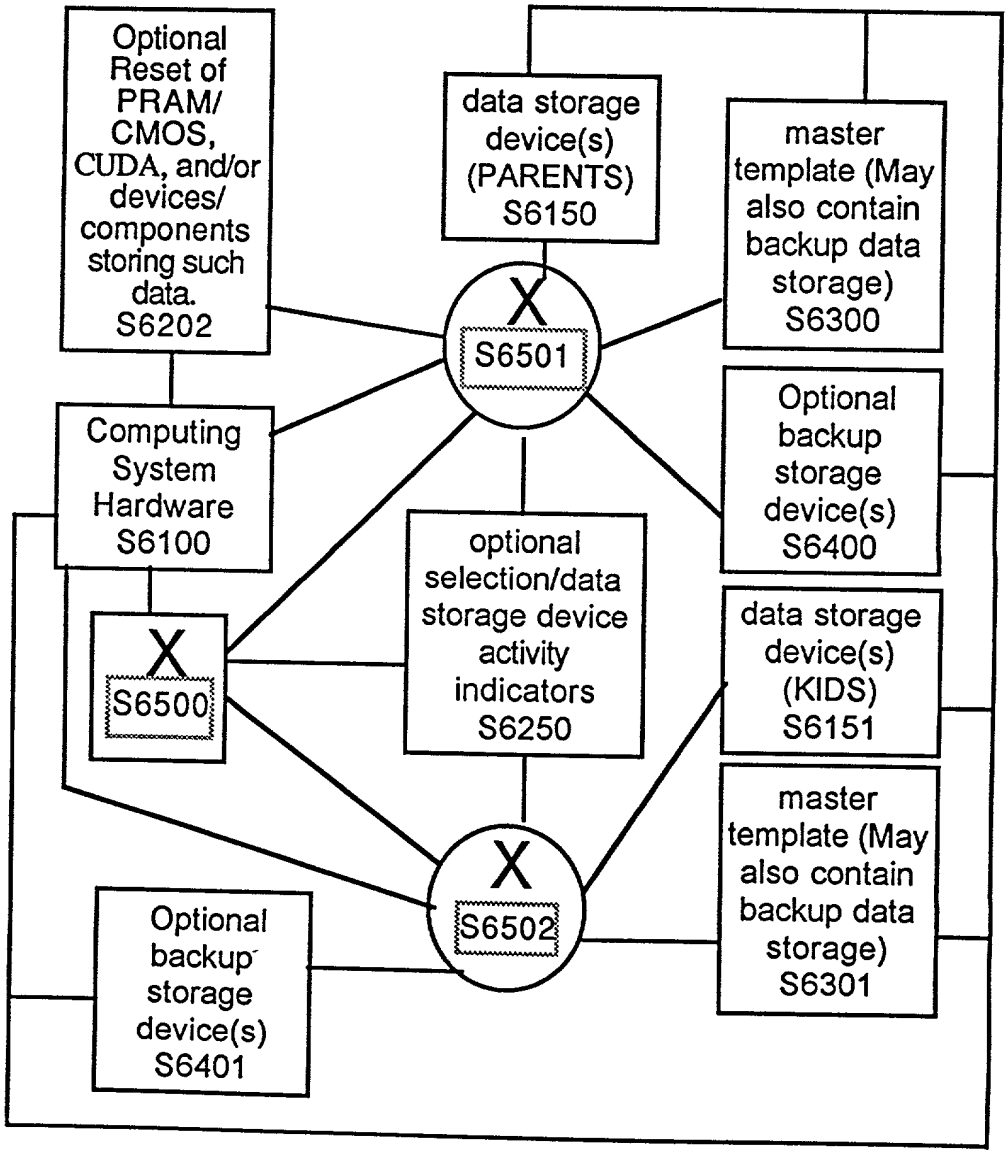

Optional Reset of PRAM/ CMOS, CUDA, and/or devices/ components storing such data. S6202
data storage device(s) (PARENTS) S6150
master template (May also contain backup data storage) S6300
X
S6501
Computing System Hardware S6100
Optional backup storage device(s) S6400
optional selection/data storage device activity indicators S6250
X
S6500
data storage device(s) (KIDS) S6151
master template (May also contain backup data storage) S6301
X
S6502
Optional backup storage device(s) S6401

Figure S7

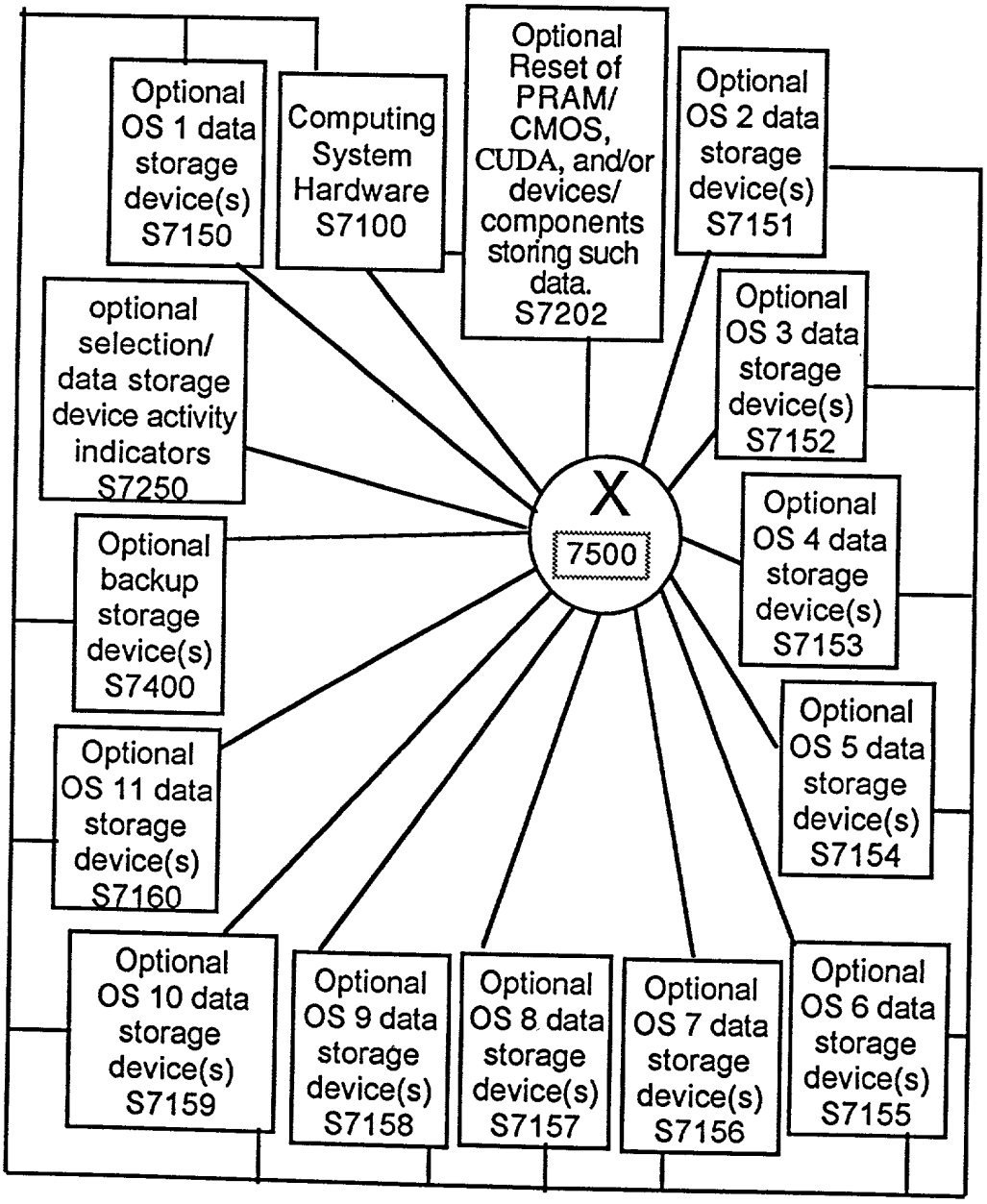

Optional OS 1 data storage device(s) S7150
Computing System Hardware S7100
Optional Reset of PRAM/ CMOS, CUDA, and/or devices/ components storing such data. S7202
Optional OS 2 data storage device(s) S7151
optional selection/ data storage device activity indicators S7250
Optional OS 3 data storage device(s) S7152
X
7500
Optional backup storage device(s) S7400
Optional OS 4 data storage device(s) S7153
Optional OS 11 data storage device(s) S7160
Optional OS 5 data storage device(s) S7154
Optional OS 10 data storage device(s) S7159
Optional OS 9 data storage device(s) S7158
Optional OS 8 data storage device(s) S7157
Optional OS 7 data storage device(s) S7156
Optional OS 6 data storage device(s) S7155

Figure S8

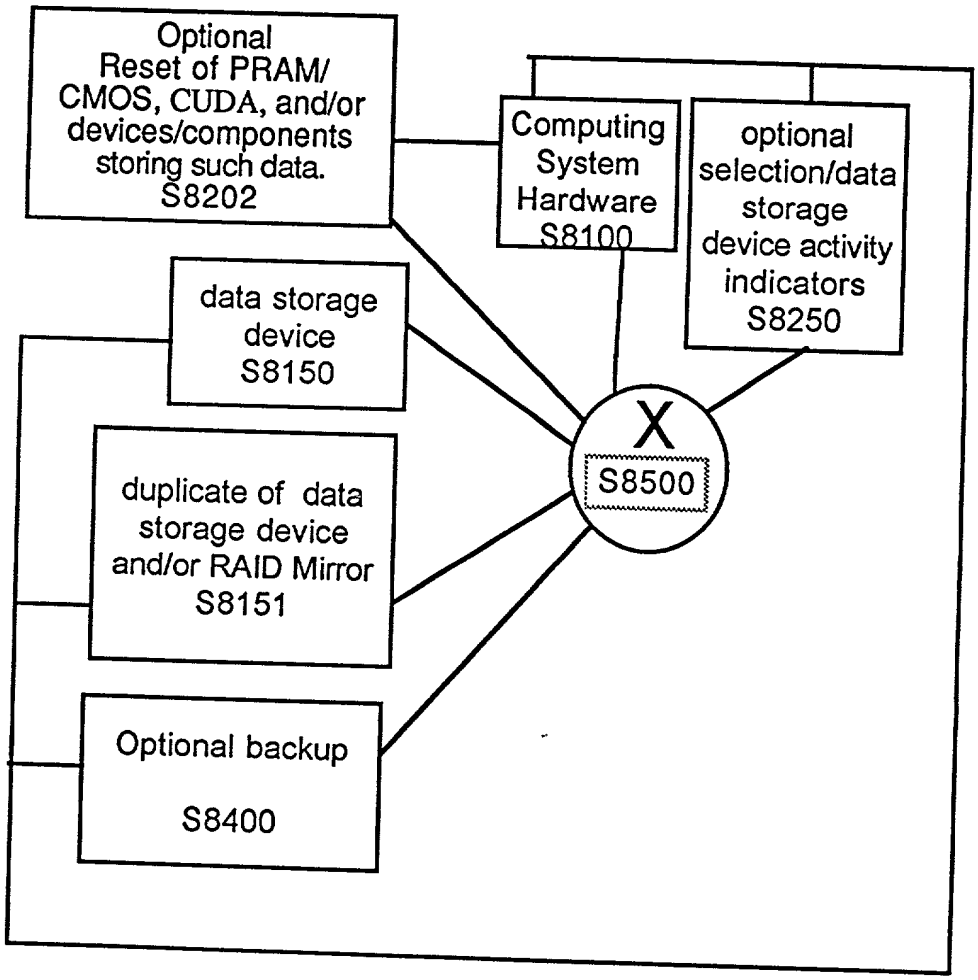
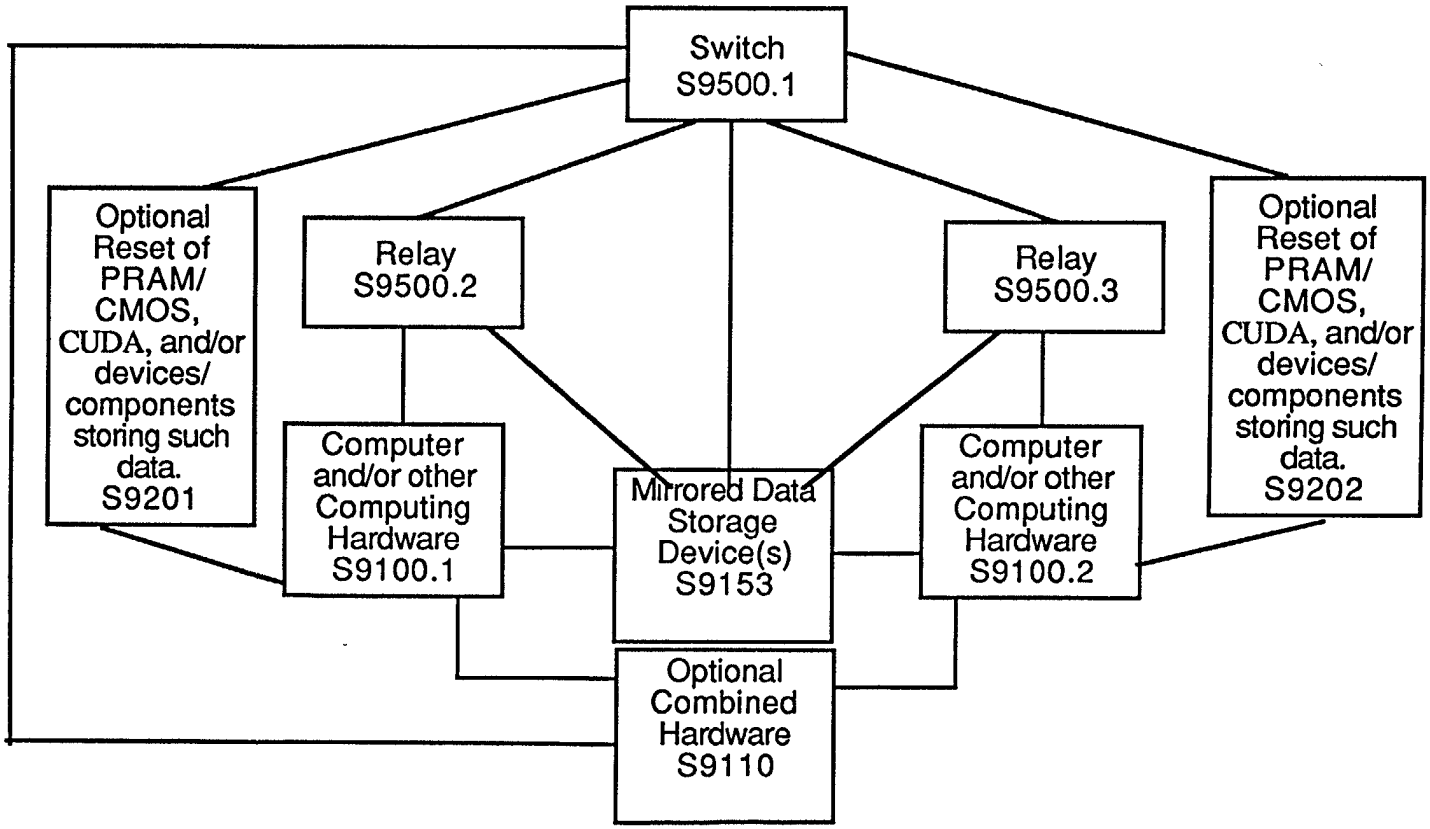

Optional
Reset of PRAM/
CMOS, CUDA, and/or
devices/components
storing such data.
S8202
Computing
System
Hardware
S8100
optional
selection/data
storage
device activity
indicators
S8250
data storage
device
S8150
X
S8500
duplicate of data
storage device
and/or RAID Mirror
S8151
Optional backup
S8400

Figure S9


Switch
S9500.1
Optional
Reset of
PRAM/
CMOS,
CUDA, and/or
devices/
components
storing such
data.
S9201
Relay
S9500.2
Relay
S9500.3
Optional
Reset of
PRAM/
CMOS,
CUDA, and/or
devices/
components
storing such
data.
S9202
Computer
and/or other
Computing
Hardware
S9100.1
Mirrored Data
Storage
Device(s)
S9153
Computer
and/or other
Computing
Hardware
S9100.2
Optional
Combined
Hardware
S9110

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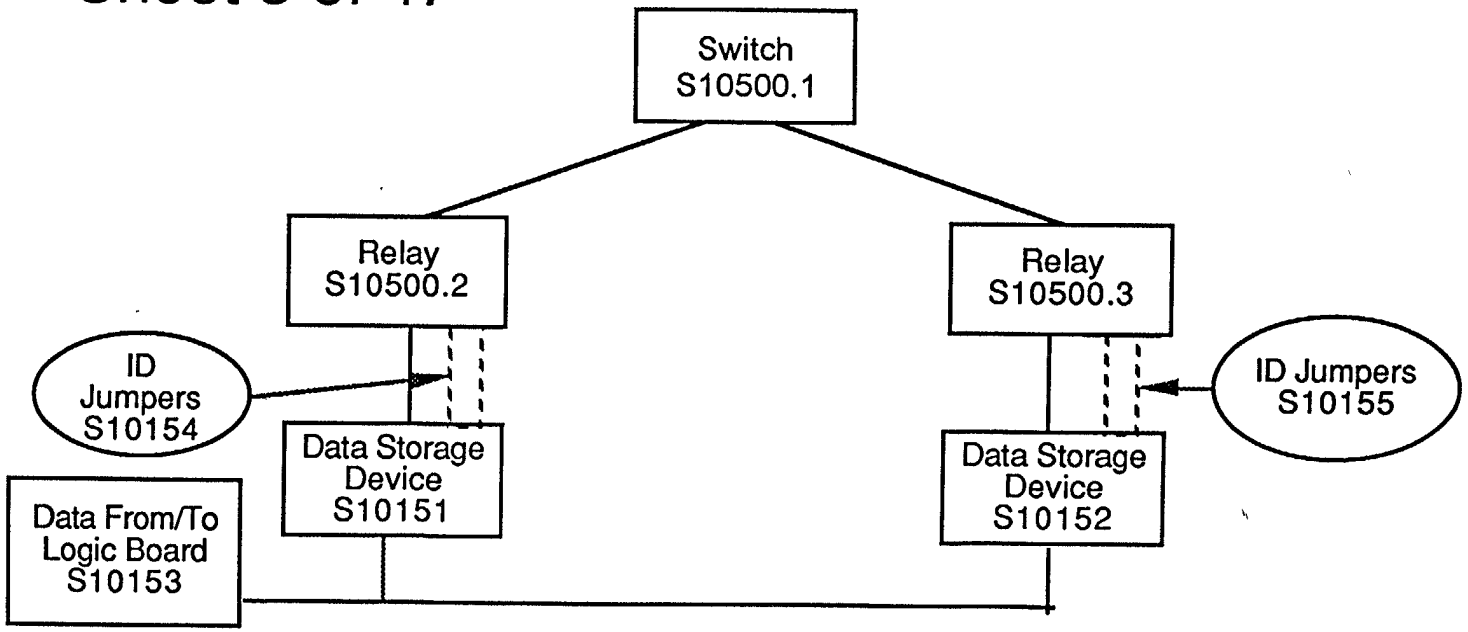
Sheet 8 of 47

Figure S10



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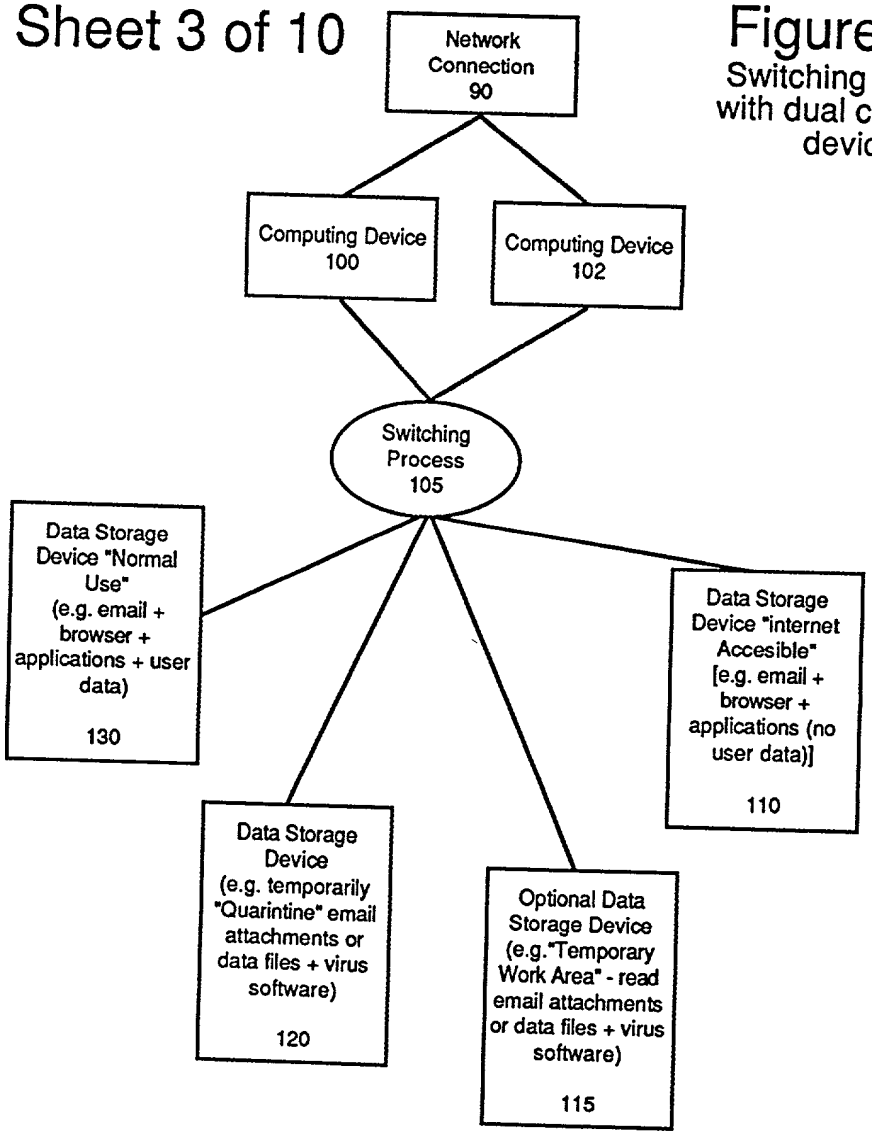

Figure S11
Switching Process with dual computing devices

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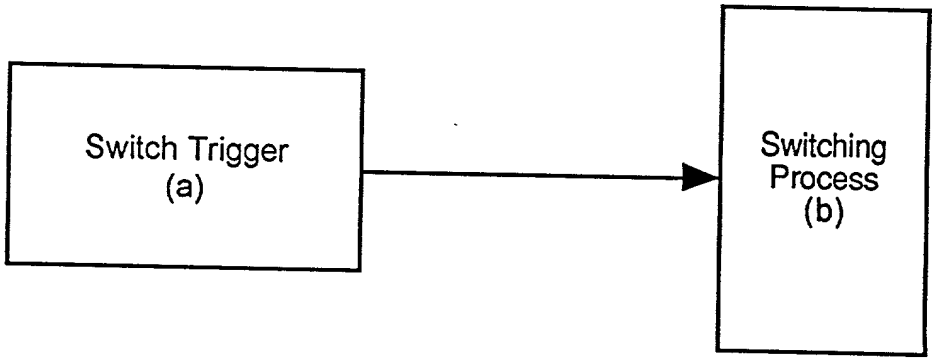
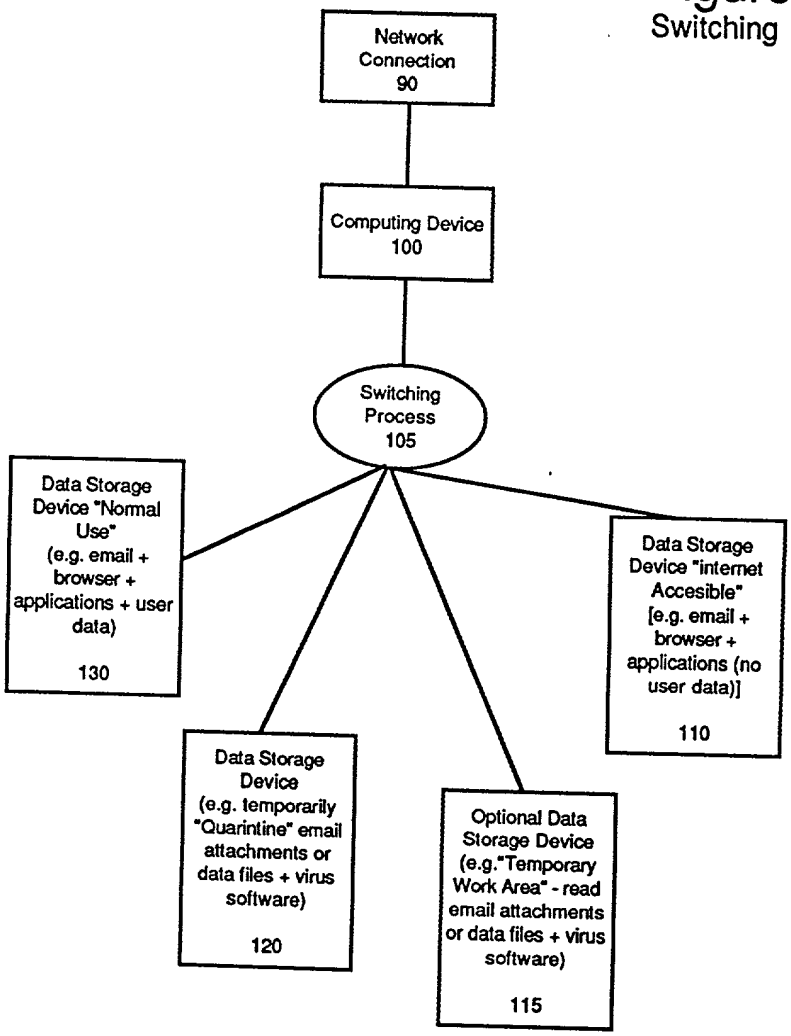
09/674,694 - 26 Oct 2001

Figure S12 Sheet 13 of 47



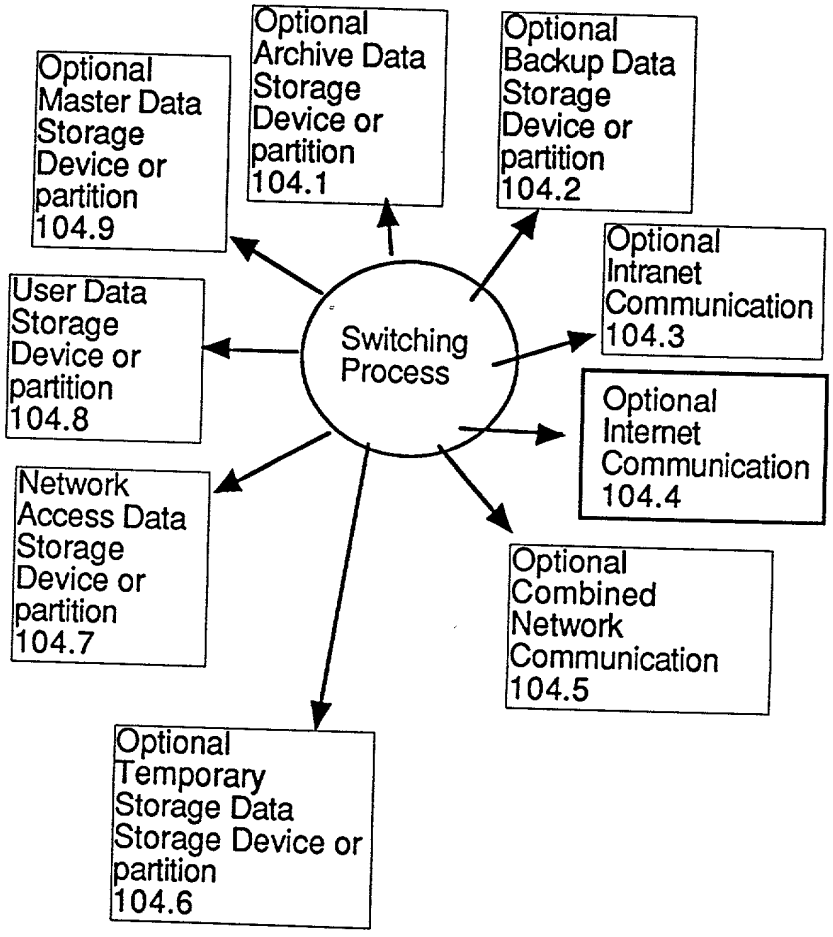
Attorney Docket No. 50277-2001

Figure S13
Switching Process



Sheet 4 of 10

Figure S14



Hacking and Virus Proof Computing Device 104.10

Figure S18 Sheet of

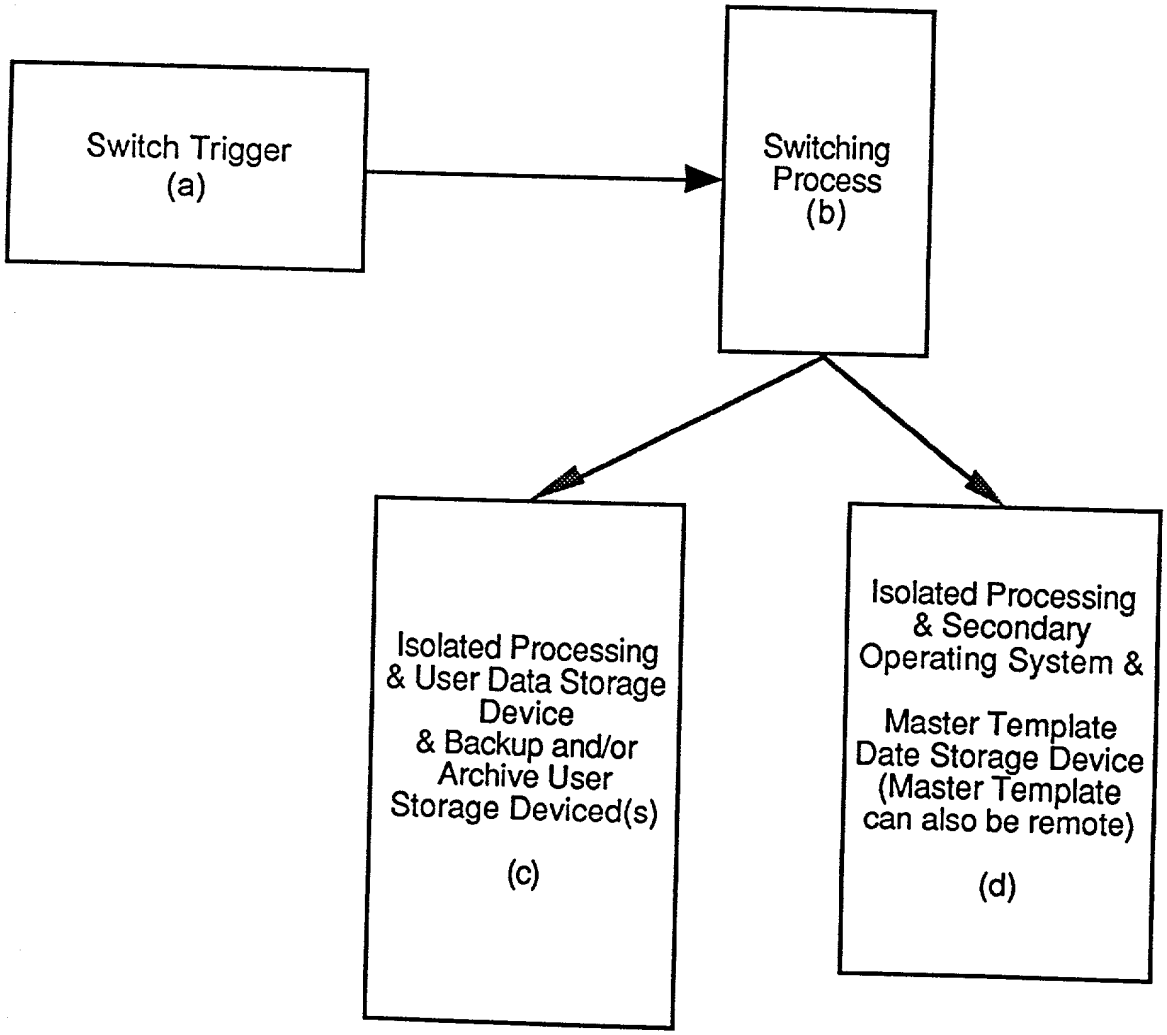


Figure S19

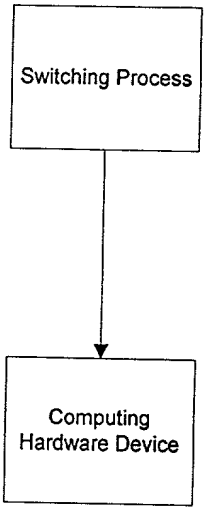


Figure S20

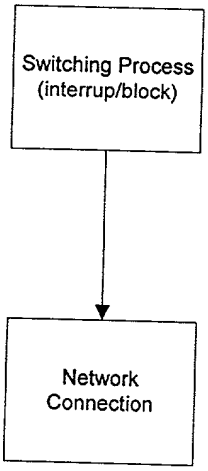


Figure S21

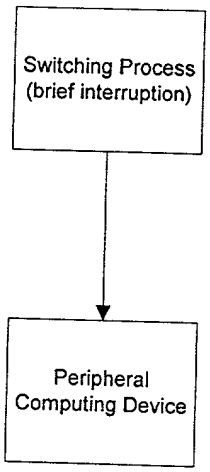


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Figure S22 Anti-Virus with shared computing device

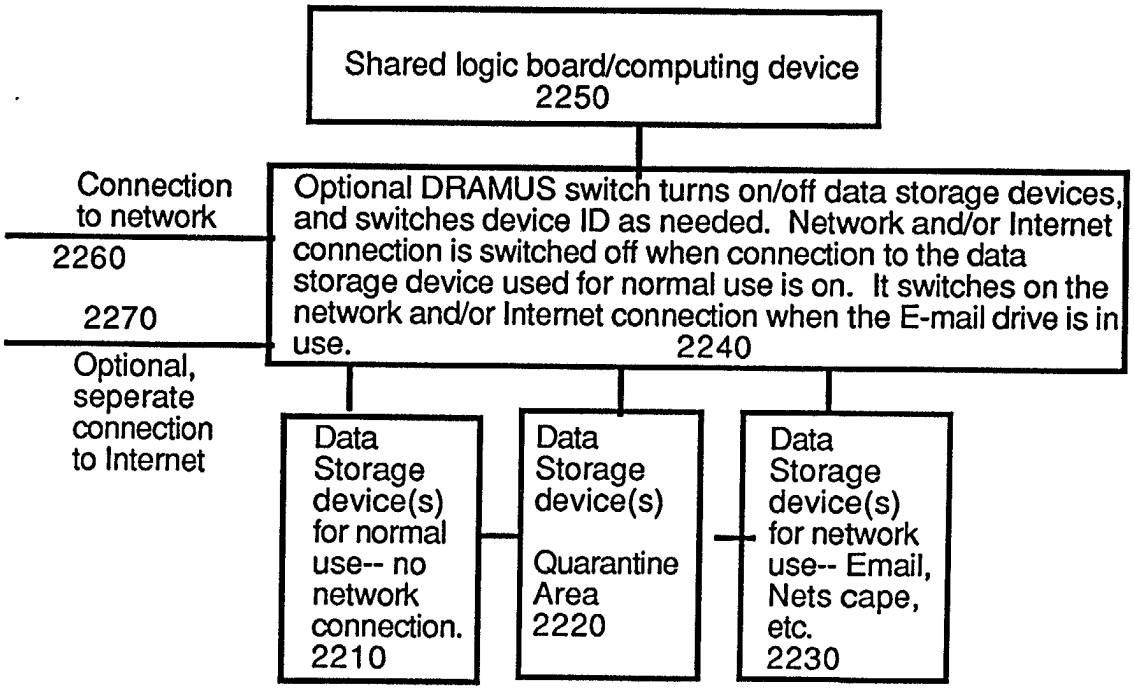

FIGURE S23

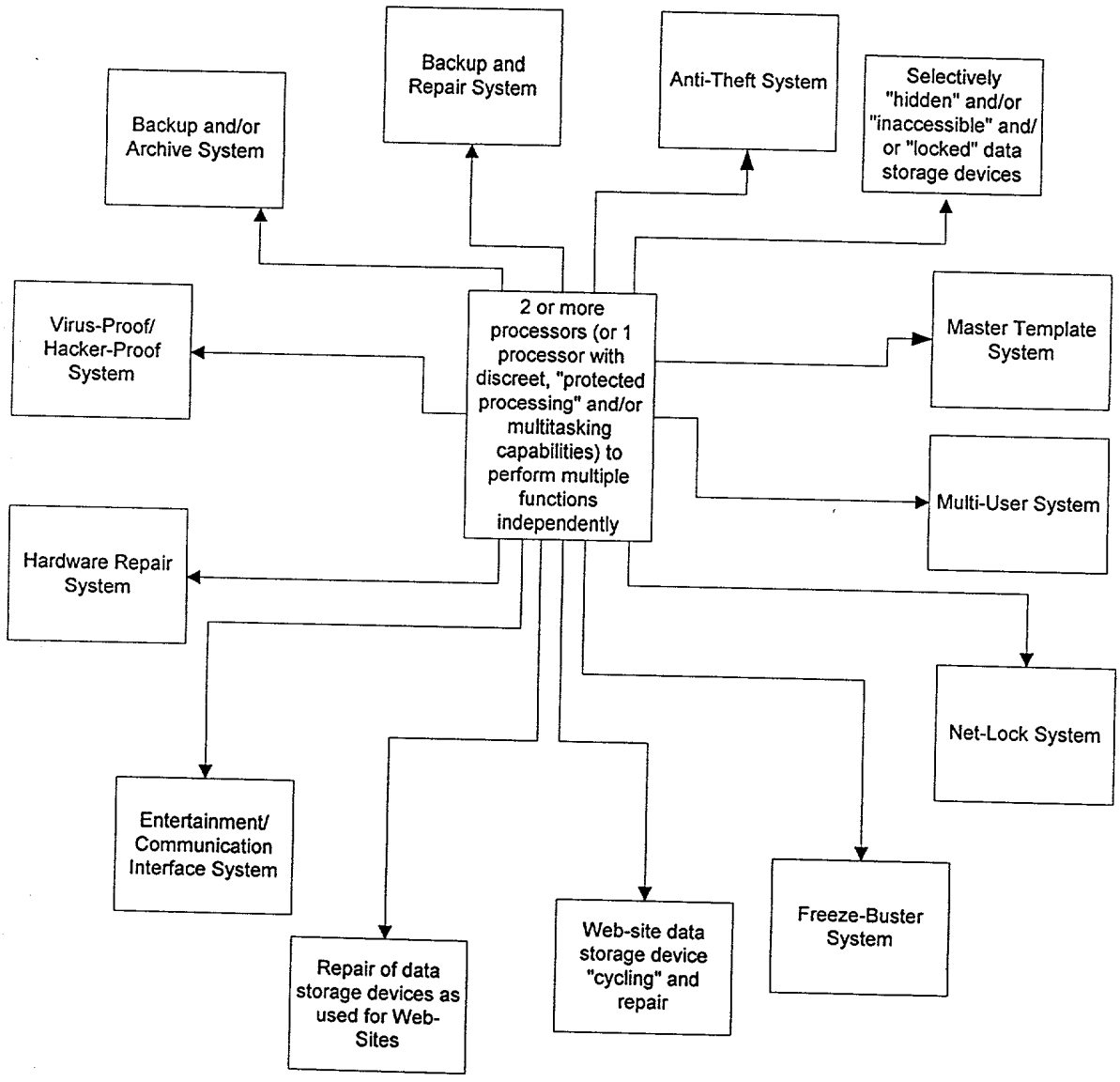
Backup and/or Archive System
Backup and Repair System
Anti-Theft System
Selectively "hidden" and/or "inaccessible" and/ or "locked" data storage devices
Virus-Proof/ Hacker-Proof System
2 or more processors (or 1 processor with discreet, "protected processing" and/or multitasking capabilities) to perform multiple functions independently
Master Template System
Multi-User System
Hardware Repair System
Net-Lock System
Entertainment/ Communication Interface System
Repair of data storage devices as used for Web-Sites
Web-site data storage device "cycling" and repair
Freeze-Buster System

Figure F20
Multi user

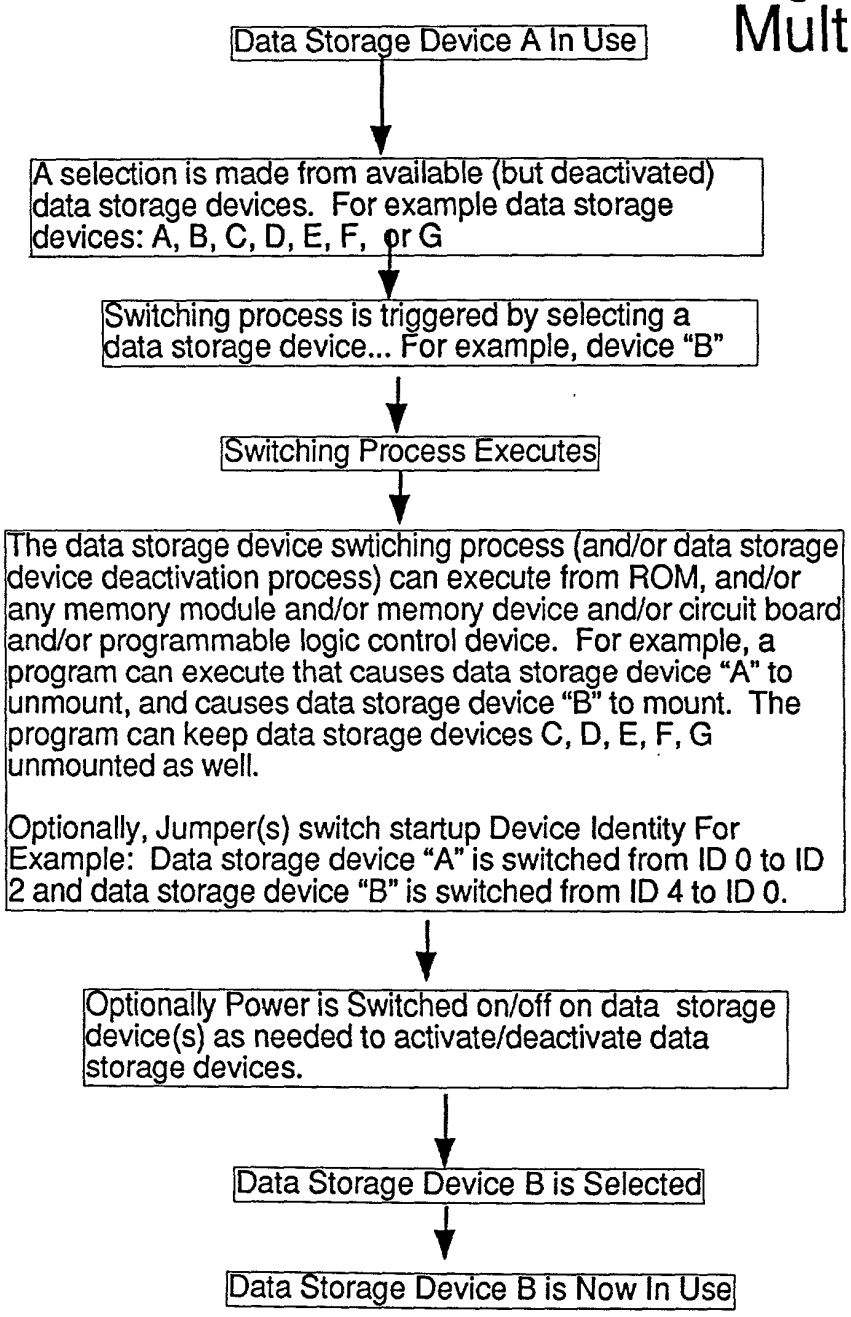

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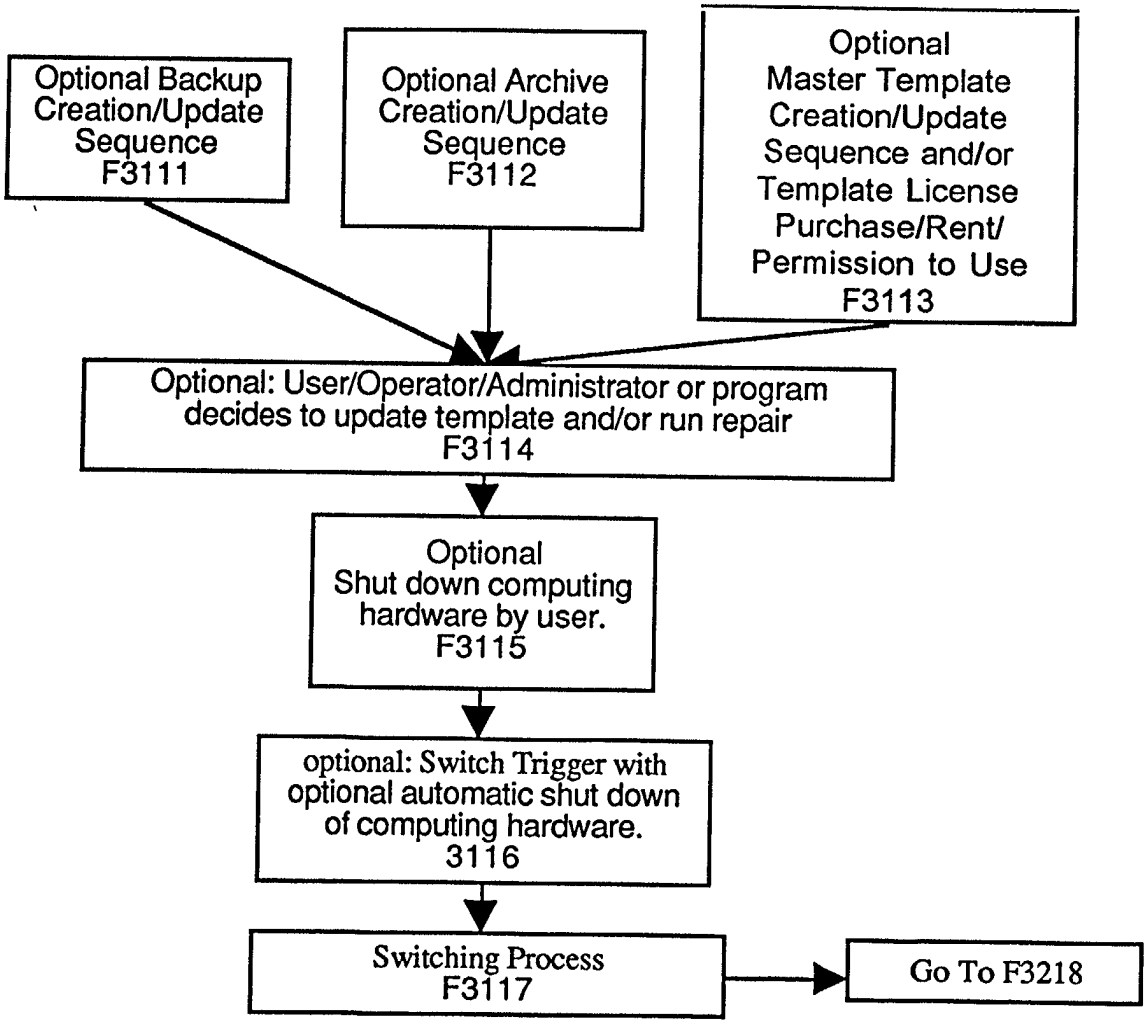
Figure F31


Optional Backup Creation/Update Sequence F3111
Optional Archive Creation/Update Sequence F3112
Optional Master Template Creation/Update Sequence and/or Template License Purchase/Rent/ Permission to Use F3113
Optional: User/Operator/Administrator or program decides to update template and/or run repair F3114
Optional Shut down computing hardware by user. F3115
optional: Switch Trigger with optional automatic shut down of computing hardware. 3116
Switching Process F3117
Go To F3218

20T120"989h7001

Figure F32 Sheet 15 of 47

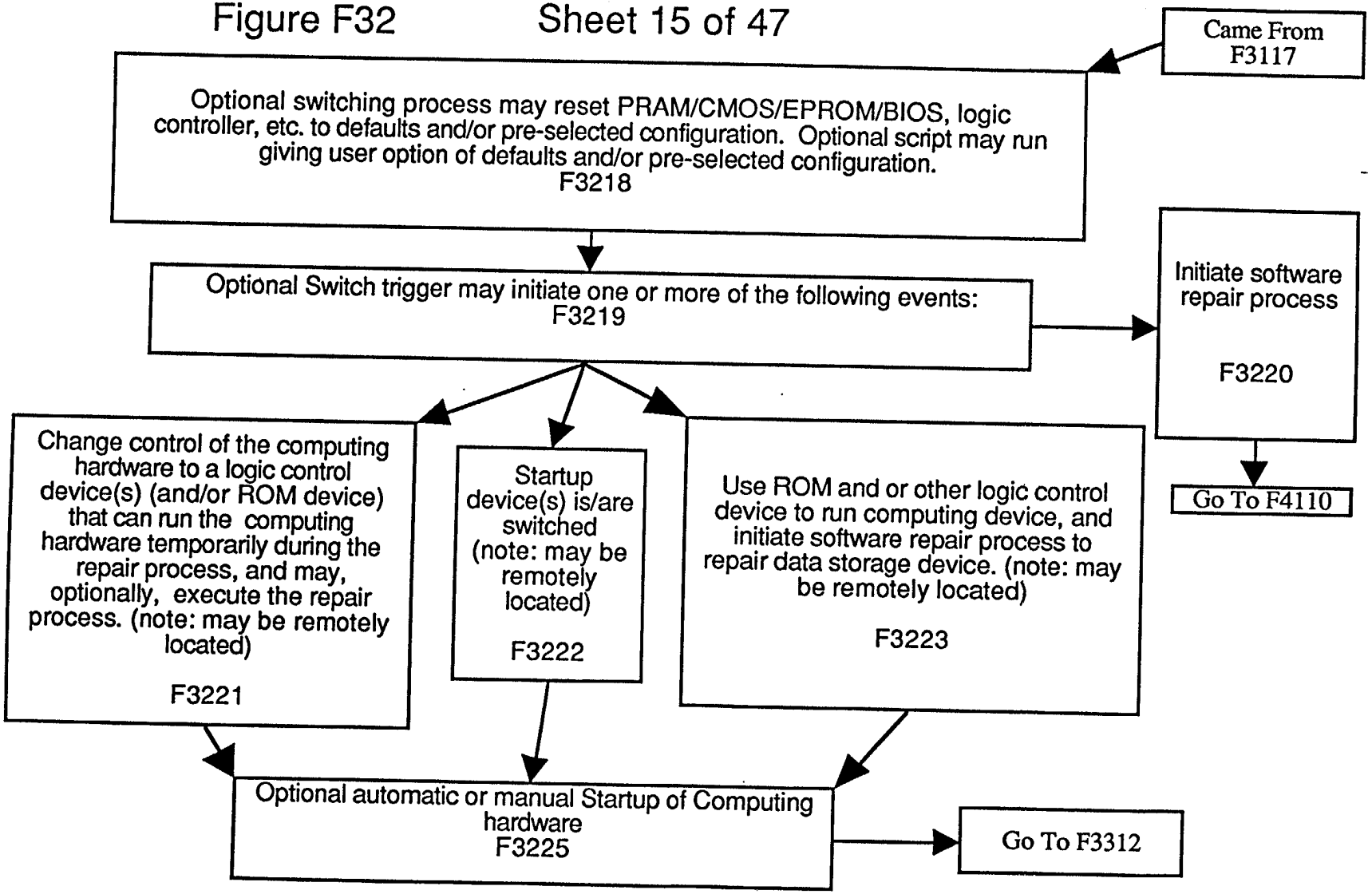
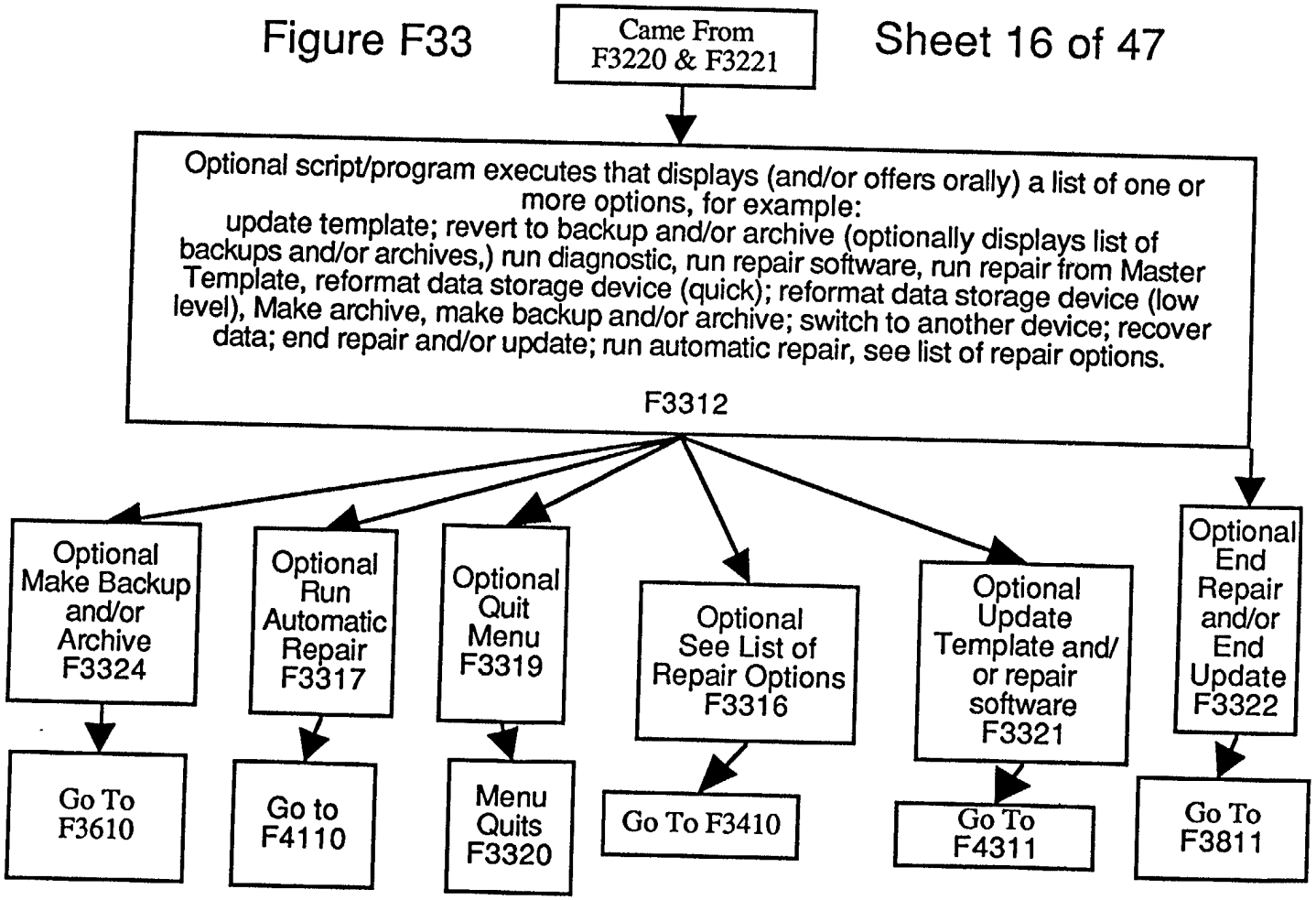


Figure F33


Came From F3220 & F3221
Optional script/program executes that displays (and/or offers orally) a list of one or more options, for example:
update template; revert to backup and/or archive (optionally displays list of backups and/or archives,) run diagnostic, run repair software, run repair from Master Template, reformat data storage device (quick); reformat data storage device (low level), Make archive, make backup and/or archive; switch to another device; recover data; end repair and/or update; run automatic repair, see list of repair options.
F3312
Optional Make Backup and/or Archive F3324
Optional Run Automatic Repair F3317
Optional Quit Menu F3319
Optional See List of Repair Options F3316
Optional Update Template and/ or repair software F3321
Optional End Repair and/or End Update F3322
Go To F3610
Go to F4110
Menu Quits F3320
Go To F3410
Go To F4311
Go To F3811

20T120 989h200T

Figure F34

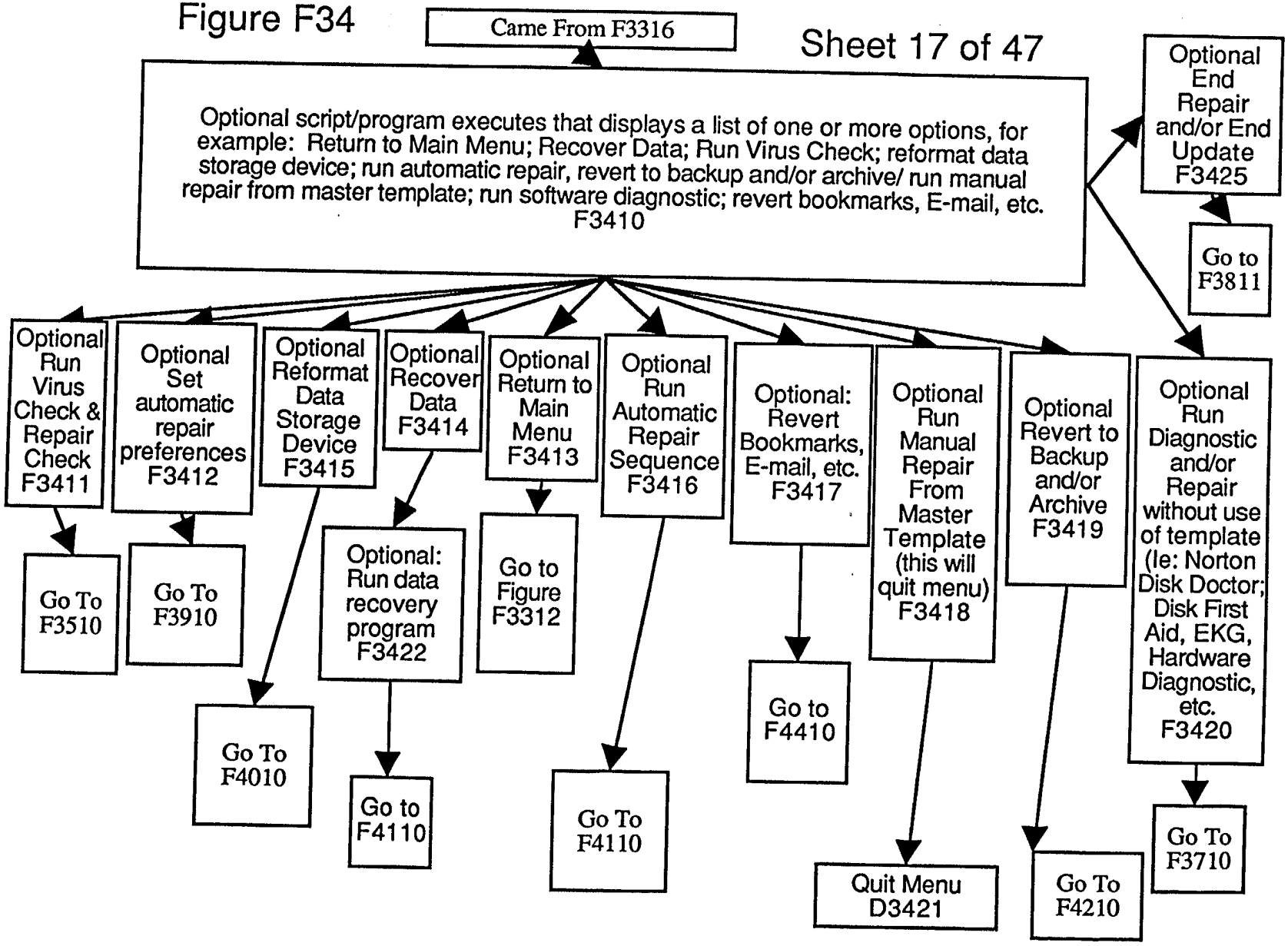
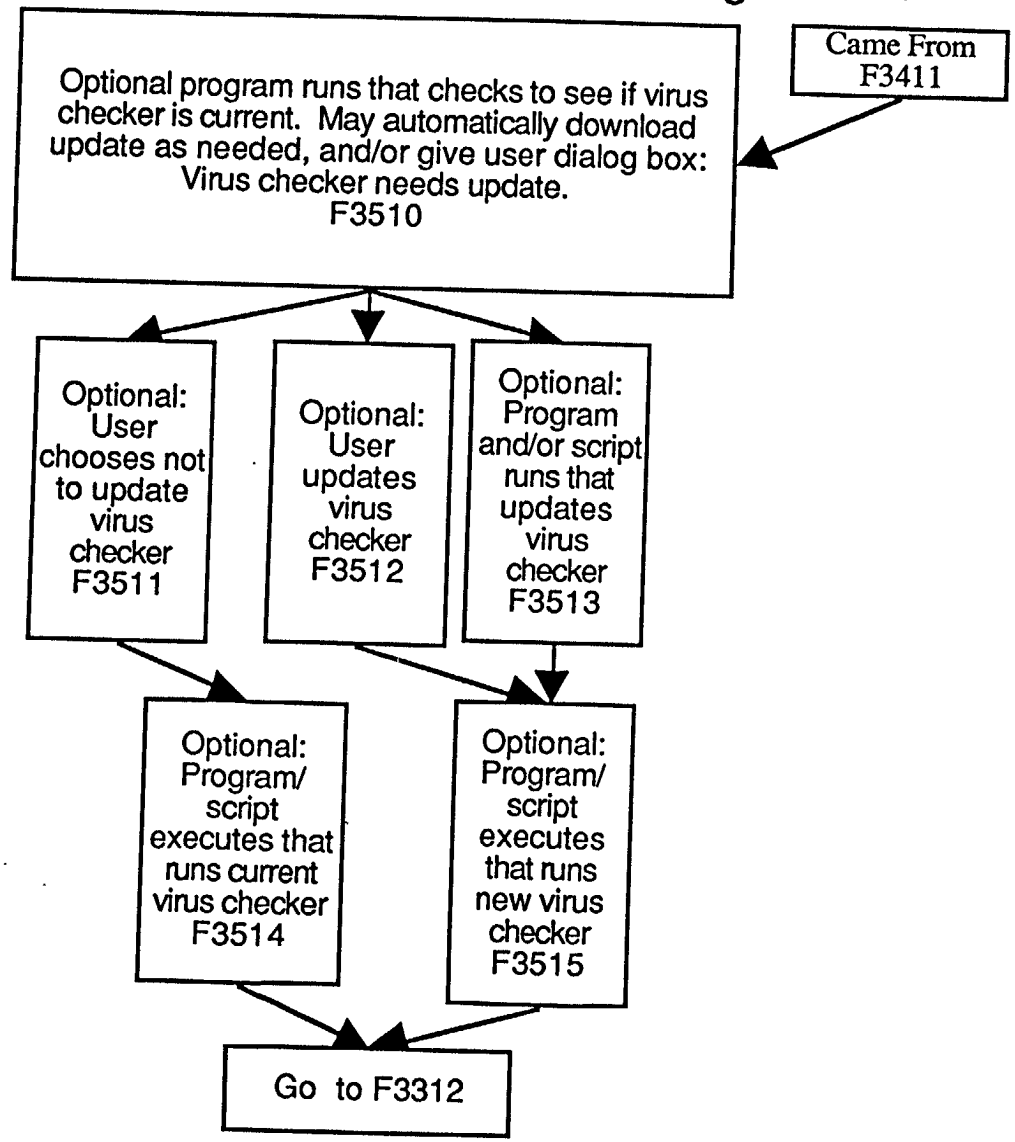


Figure F35


Came From F3411
Optional program runs that checks to see if virus checker is current. May automatically download update as needed, and/or give user dialog box: Virus checker needs update. F3510
Optional: User chooses not to update virus checker F3511
Optional: User updates virus checker F3512
Optional: Program and/or script runs that updates virus checker F3513
Optional: Program/ script executes that runs current virus checker F3514
Optional: Program/ script executes that runs new virus checker F3515
Go to F3312

20T120" 989n2001

Figure F36

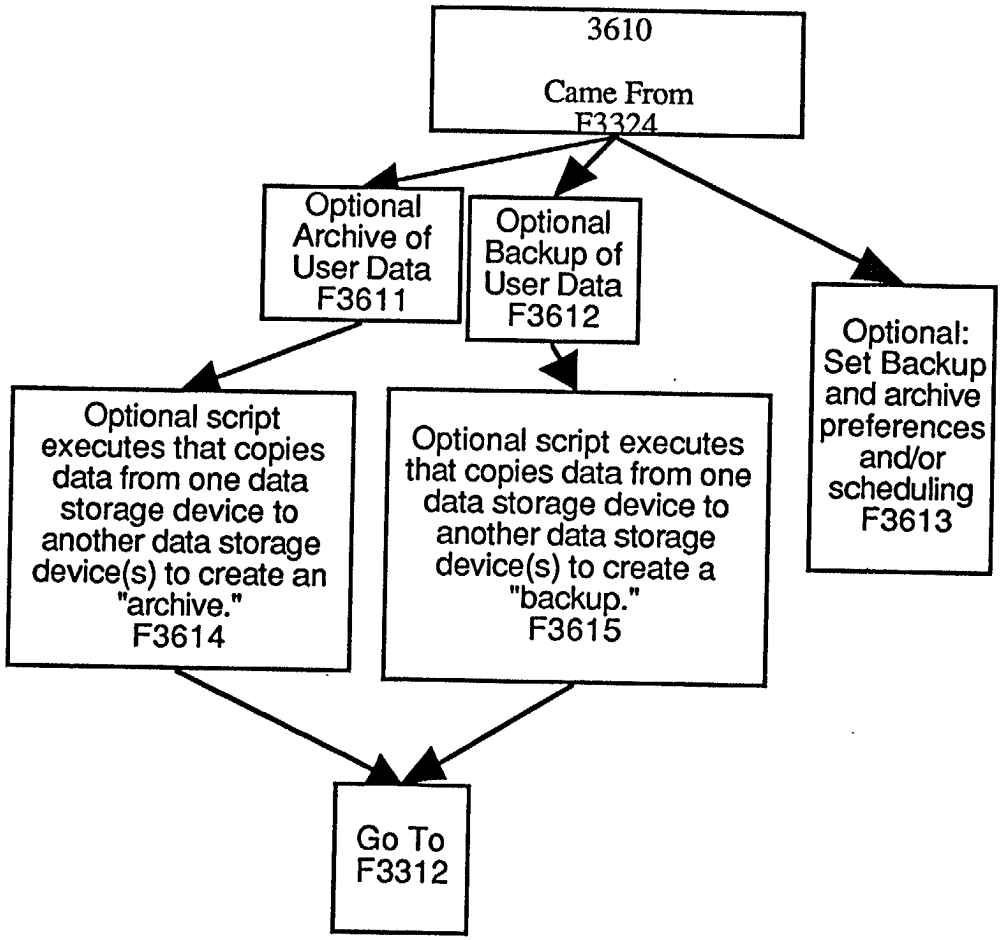


Figure F 37

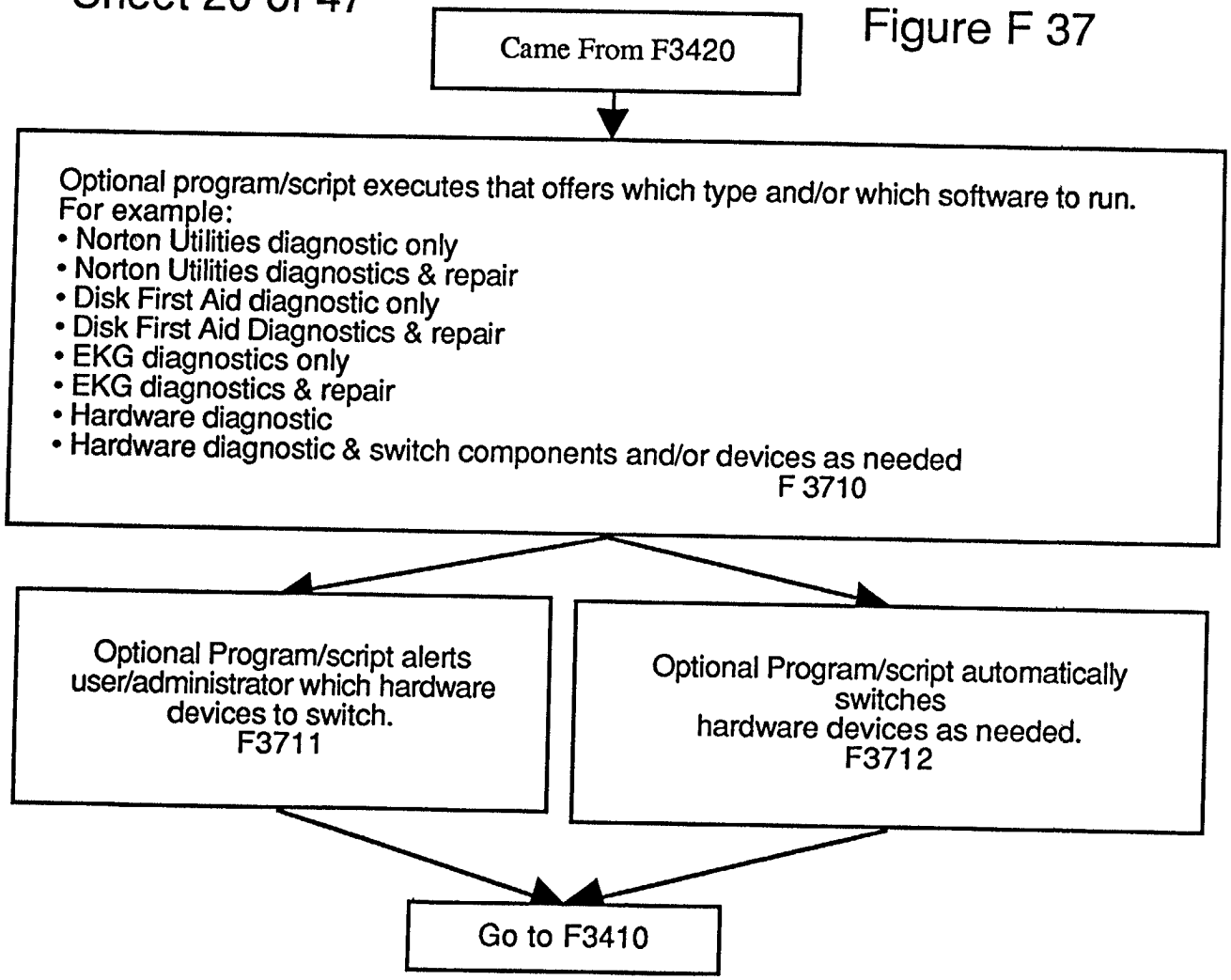
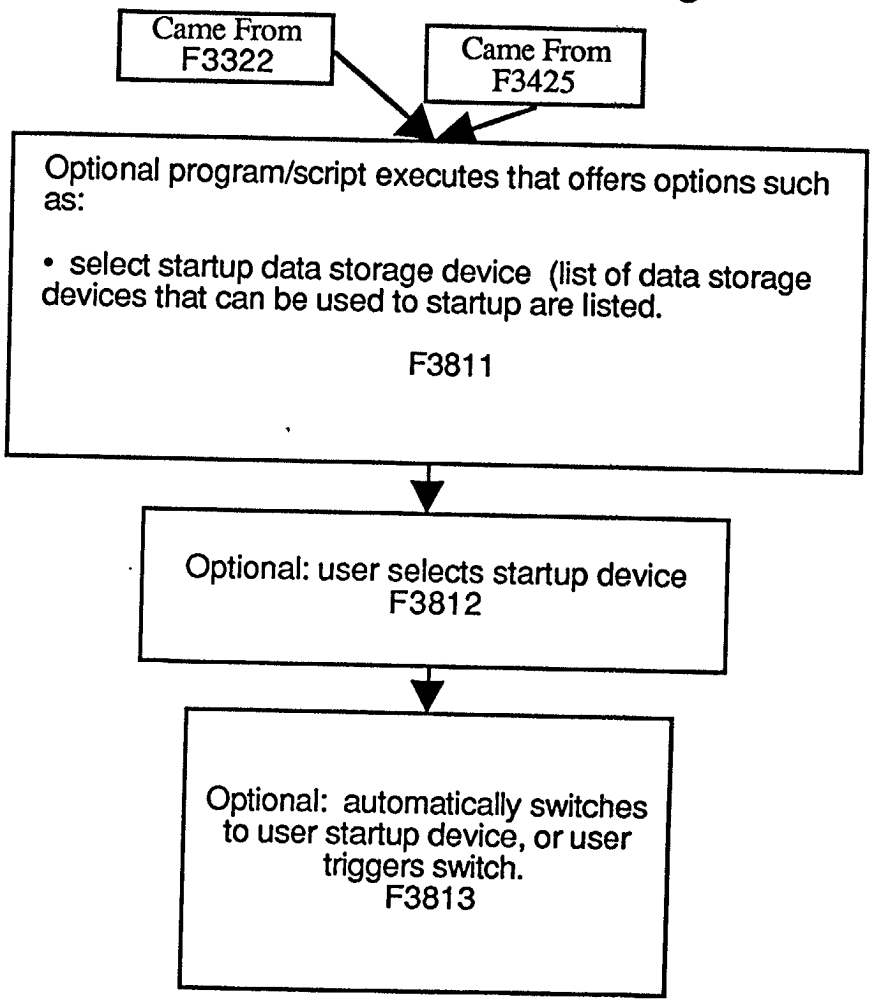

Came From F3420
Optional program/script executes that offers which type and/or which software to run.
For example:
• Norton Utilities diagnostic only
• Norton Utilities diagnostics & repair
• Disk First Aid diagnostic only
• Disk First Aid Diagnostics & repair
• EKG diagnostics only
• EKG diagnostics & repair
• Hardware diagnostic
• Hardware diagnostic & switch components and/or devices as needed
F 3710
Optional Program/script alerts user/administrator which hardware devices to switch.
F3711
Optional Program/script automatically switches hardware devices as needed.
F3712
Go to F3410

Figure F38


Came From F3322
Came From F3425
Optional program/script executes that offers options such as:
• select startup data storage device (list of data storage devices that can be used to startup are listed.
F3811
Optional: user selects startup device
F3812
Optional: automatically switches to user startup device, or user triggers switch.
F3813

20T120 9894200T

Figure F39

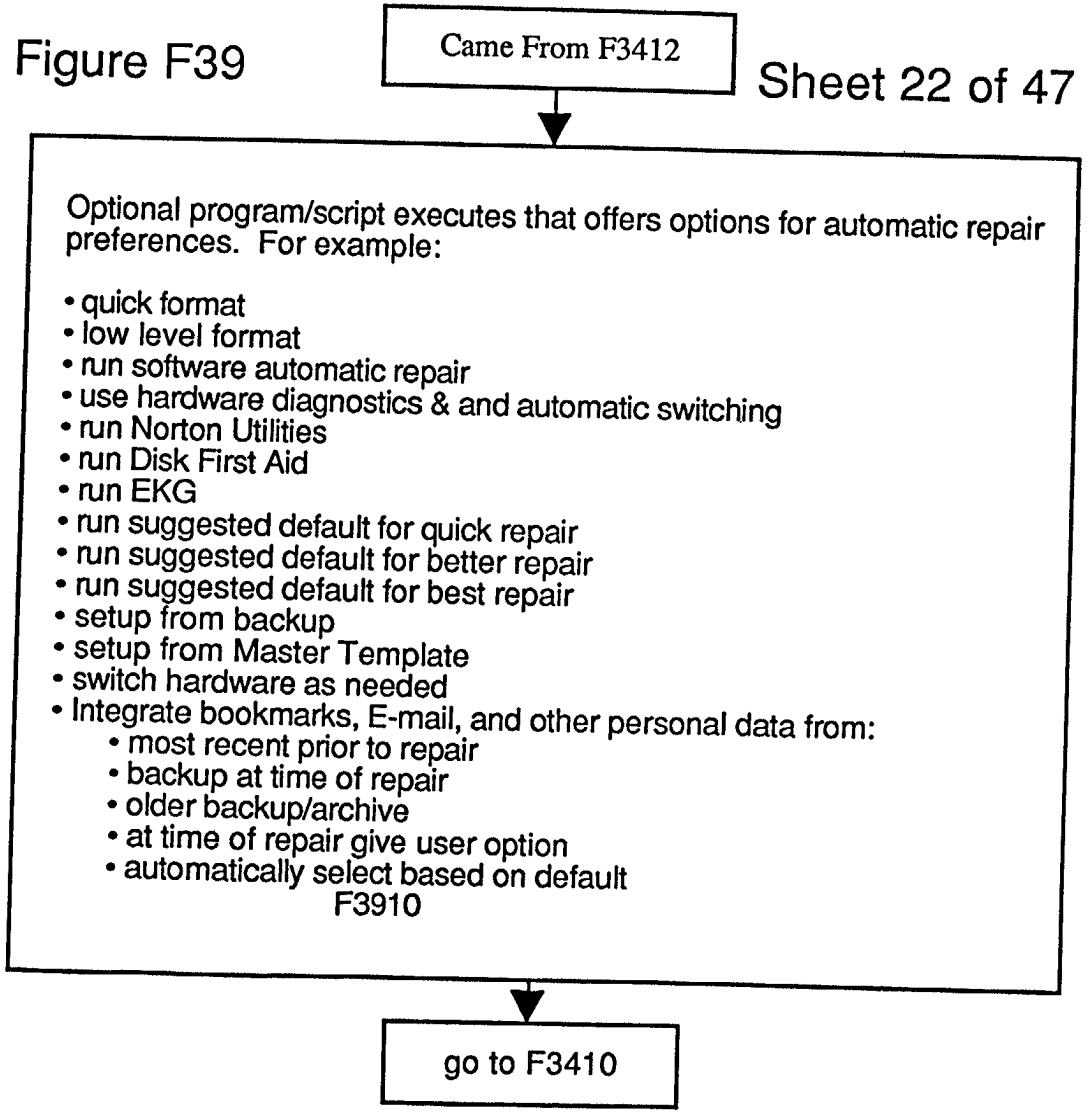


Figure F40

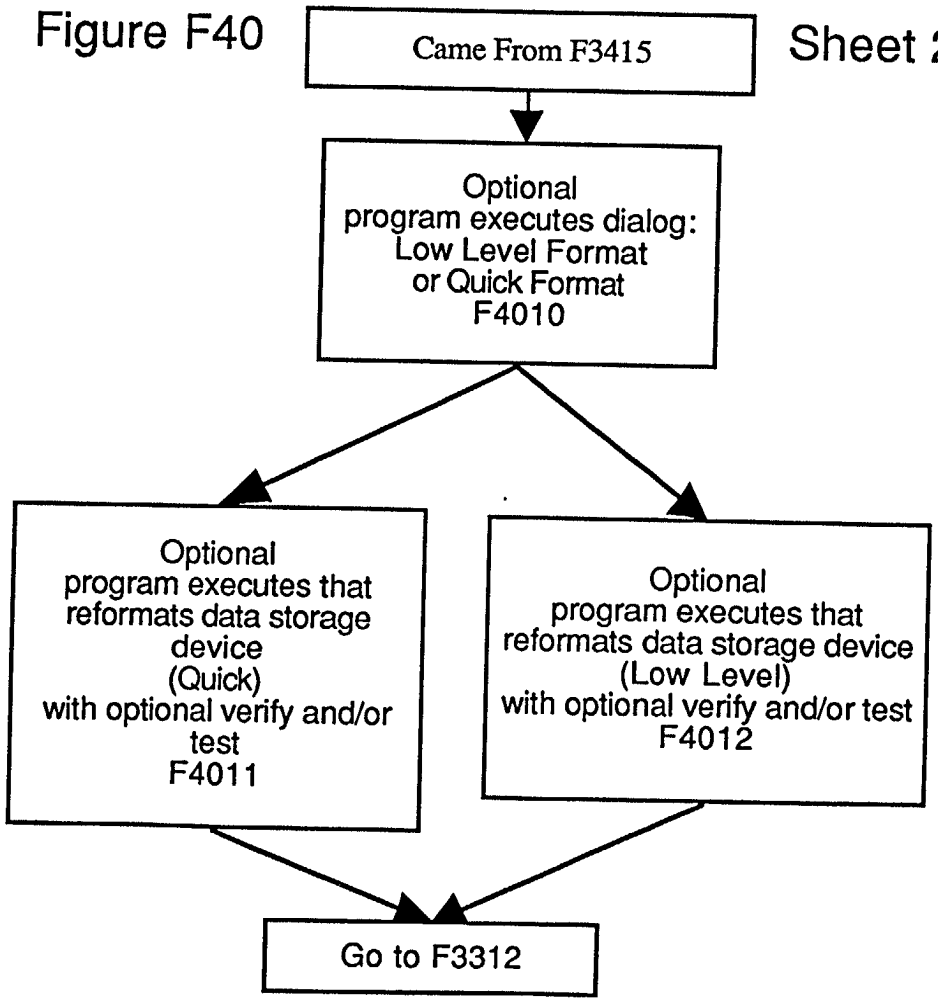

Came From F3415
Optional
program executes dialog:
Low Level Format
or Quick Format
F4010
Optional
program executes that
reformats data storage
device
(Quick)
with optional verify and/or
test
F4011
Optional
program executes that
reformats data storage device
(Low Level)
with optional verify and/or test
F4012
Go to F3312

Figure F41

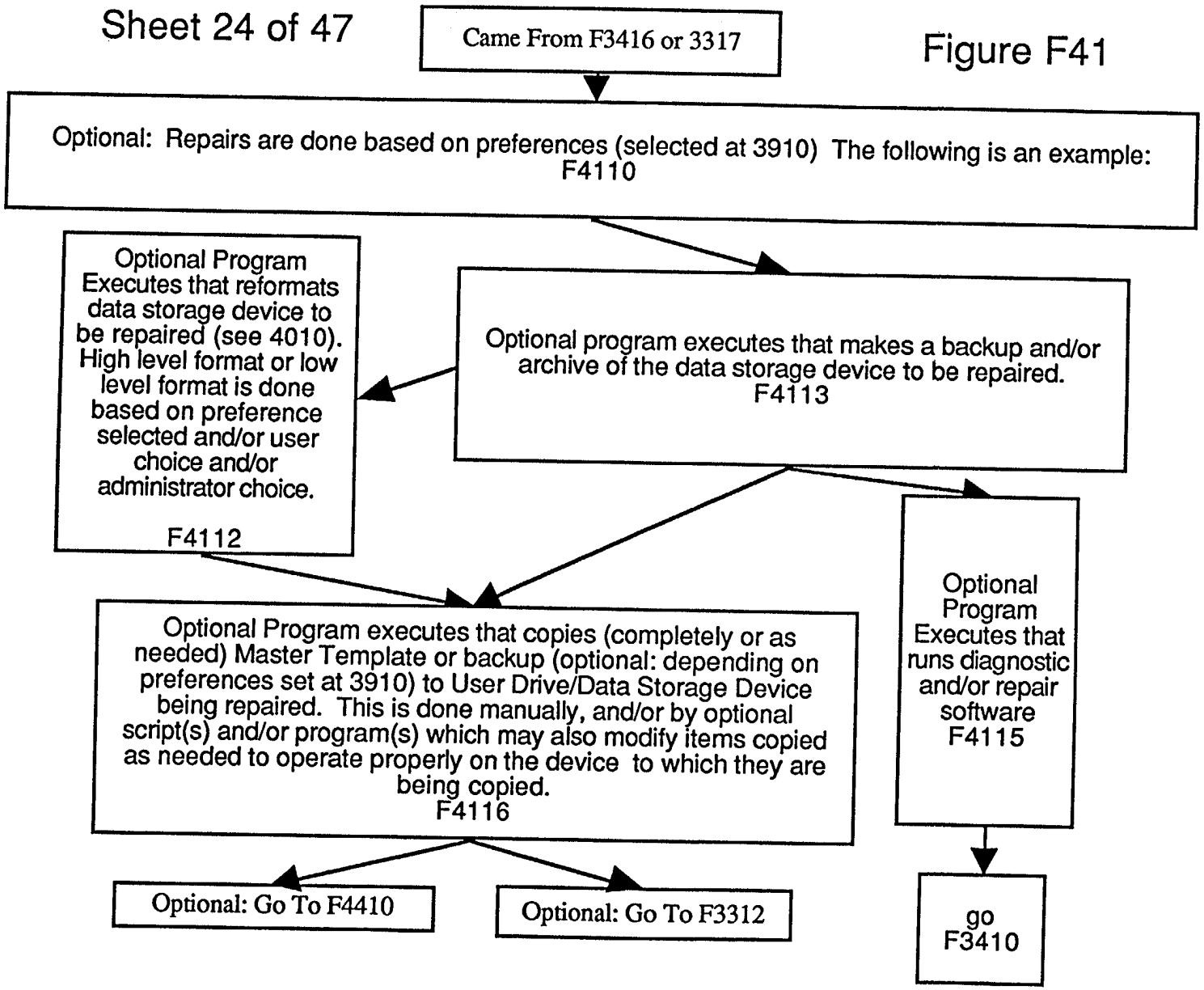
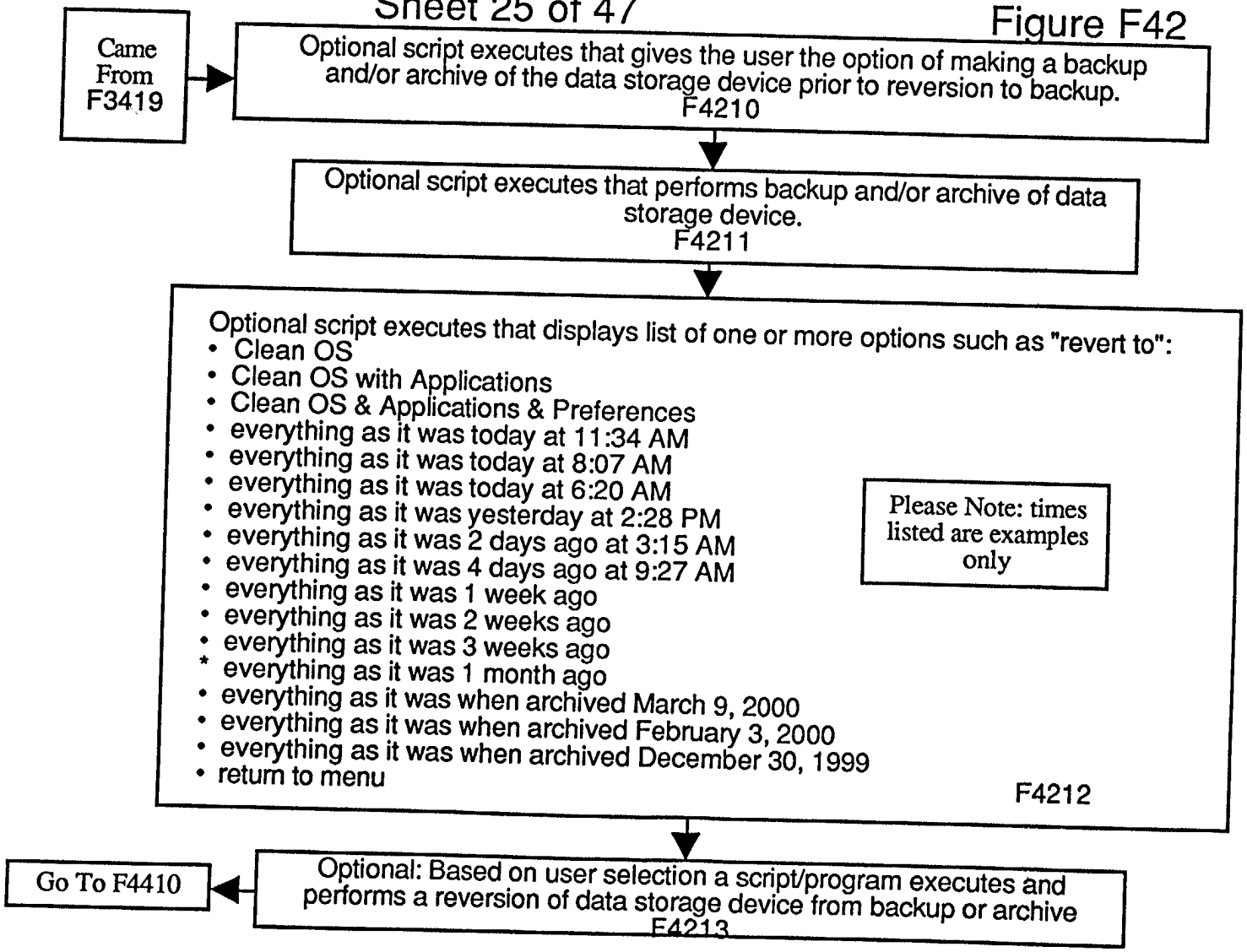

Came From F3416 or 3317
Optional: Repairs are done based on preferences (selected at 3910) The following is an example: F4110
Optional Program Executes that reformats data storage device to be repaired (see 4010). High level format or low level format is done based on preference selected and/or user choice and/or administrator choice.
F4112
Optional program executes that makes a backup and/or archive of the data storage device to be repaired.
F4113
Optional Program Executes that runs diagnostic and/or repair software
F4115
Optional Program executes that copies (completely or as needed) Master Template or backup (optional: depending on preferences set at 3910) to User Drive/Data Storage Device being repaired. This is done manually, and/or by optional script(s) and/or program(s) which may also modify items copied as needed to operate properly on the device to which they are being copied.
F4116
Optional: Go To F4410
Optional: Go To F3312
go F3410

Figure F42


Came From F3419
Optional script executes that gives the user the option of making a backup and/or archive of the data storage device prior to reversion to backup.
F4210
Optional script executes that performs backup and/or archive of data storage device.
F4211
Optional script executes that displays list of one or more options such as "revert to":
• Clean OS
• Clean OS with Applications
• Clean OS & Applications & Preferences
• everything as it was today at 11:34 AM
• everything as it was today at 8:07 AM
• everything as it was today at 6:20 AM
• everything as it was yesterday at 2:28 PM
• everything as it was 2 days ago at 3:15 AM
• everything as it was 4 days ago at 9:27 AM
• everything as it was 1 week ago
• everything as it was 2 weeks ago
• everything as it was 3 weeks ago
* everything as it was 1 month ago
• everything as it was when archived March 9, 2000
• everything as it was when archived February 3, 2000
• everything as it was when archived December 30, 1999
• return to menu
Please Note: times listed are examples only
F4212
Optional: Based on user selection a script/program executes and performs a reversion of data storage device from backup or archive
F4213
Go To F4410

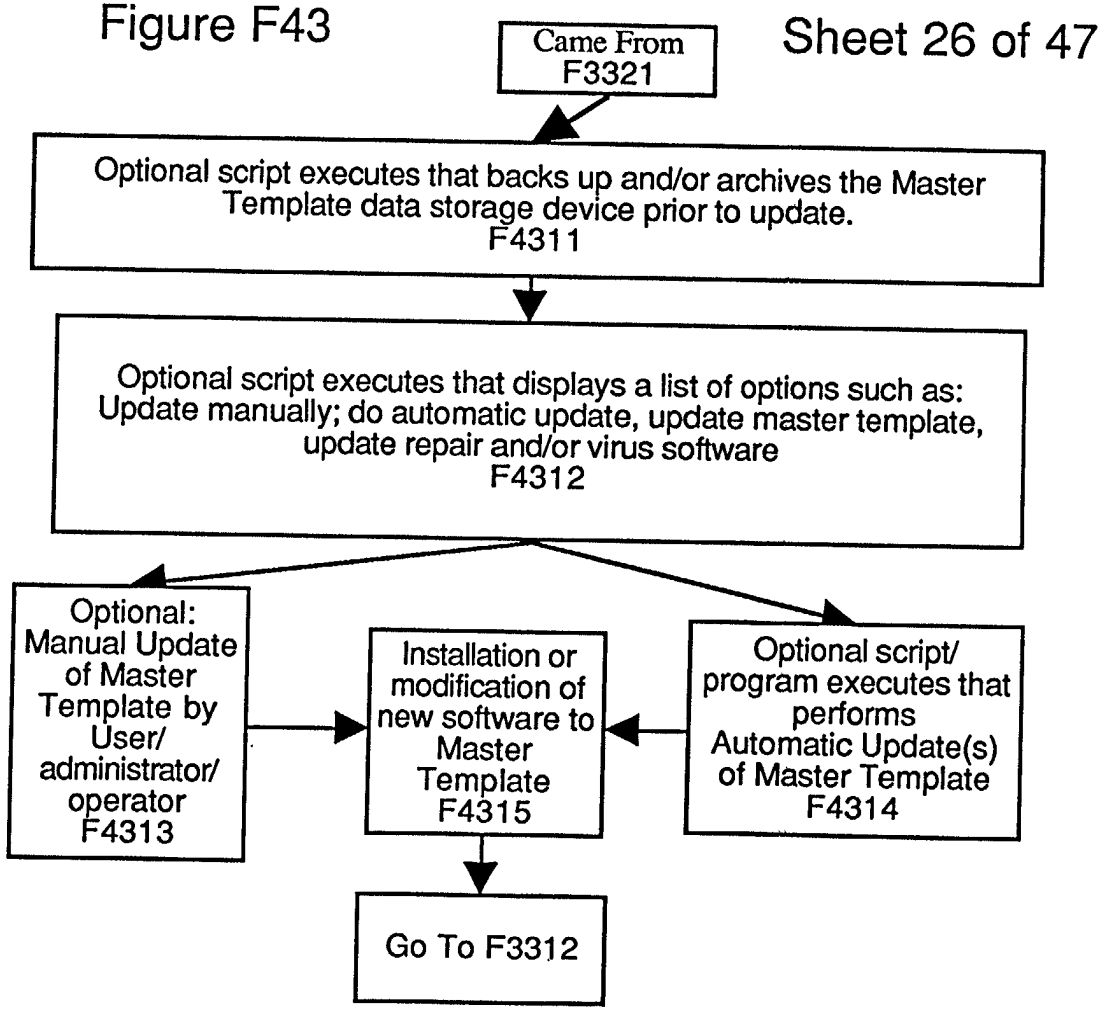

Came From F3321
Optional script executes that backs up and/or archives the Master Template data storage device prior to update. F4311
Optional script executes that displays a list of options such as: Update manually; do automatic update, update master template, update repair and/or virus software F4312
Optional: Manual Update of Master Template by User/ administrator/ operator F4313
Installation or modification of new software to Master Template F4315
Optional script/ program executes that performs Automatic Update(s) of Master Template F4314
Go To F3312

Figure F44

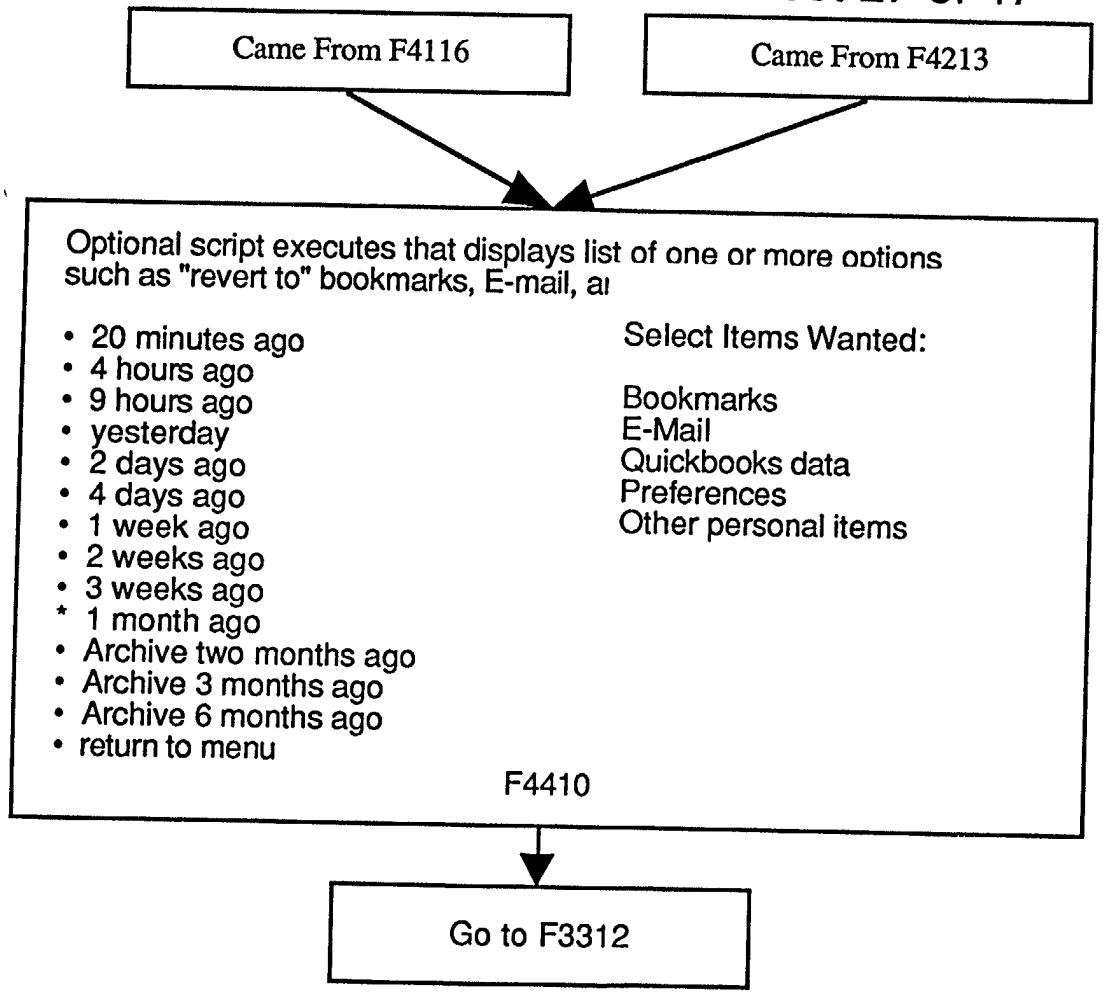
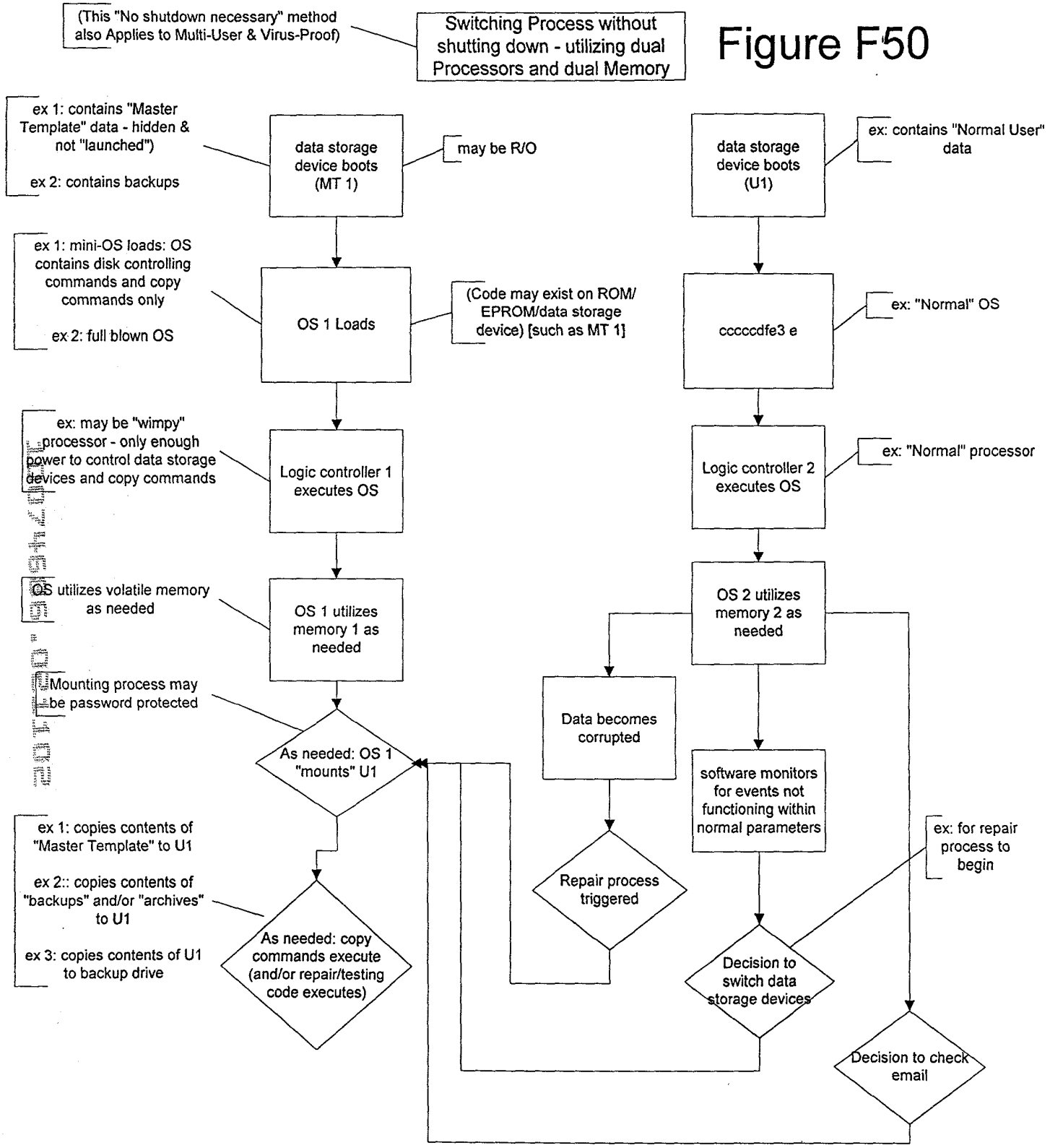
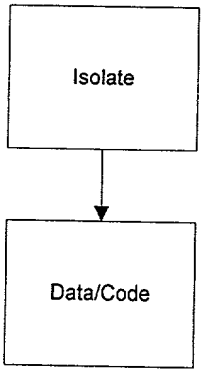

Came From F4116
Came From F4213
Optional script executes that displays list of one or more options such as "revert to" bookmarks, E-mail, a
• 20 minutes ago
• 4 hours ago
• 9 hours ago
• yesterday
• 2 days ago
• 4 days ago
• 1 week ago
• 2 weeks ago
• 3 weeks ago
* 1 month ago
• Archive two months ago
• Archive 3 months ago
• Archive 6 months ago
• return to menu
Select Items Wanted:
Bookmarks
E-Mail
Quickbooks data
Preferences
Other personal items
F4410
Go to F3312

Figure F50


(This "No shutdown necessary" method also Applies to Multi-User & Virus-Proof)
Switching Process without shutting down - utilizing dual Processors and dual Memory
ex 1: contains "Master Template" data - hidden & not "launched")
ex 2: contains backups
data storage device boots (MT 1)
may be R/O
data storage device boots (U1)
ex: contains "Normal User" data
ex 1: mini-OS loads: OS contains disk controlling commands and copy commands only
ex 2: full blown OS
OS 1 Loads
(Code may exist on ROM/ EPROM/data storage device) [such as MT 1]
ccccdfe3 e
ex: "Normal" OS
ex: may be "wimpy" processor - only enough power to control data storage devices and copy commands
Logic controller 1 executes OS
Logic controller 2 executes OS
ex: "Normal" processor
OS utilizes volatile memory as needed
OS 1 utilizes memory 1 as needed
OS 2 utilizes memory 2 as needed
Mounting process may be password protected
Data becomes corrupted
As needed: OS 1 "mounts" U1
software monitors for events not functioning within normal parameters
ex 1: copies contents of "Master Template" to U1
ex 2:: copies contents of "backups" and/or "archives" to U1
ex 3: copies contents of U1 to backup drive
Repair process triggered
ex: for repair process to begin
As needed: copy commands execute (and/or repair/testing code executes)
Decision to switch data storage devices
Decision to check email

Virus-Proof
Hacker-Proof

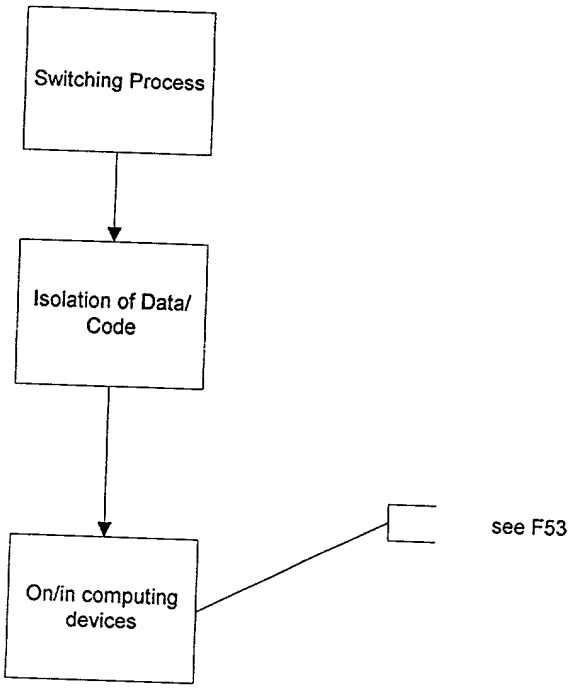
Figure F51



Sep 1, 2006 - 6:56:56 PM

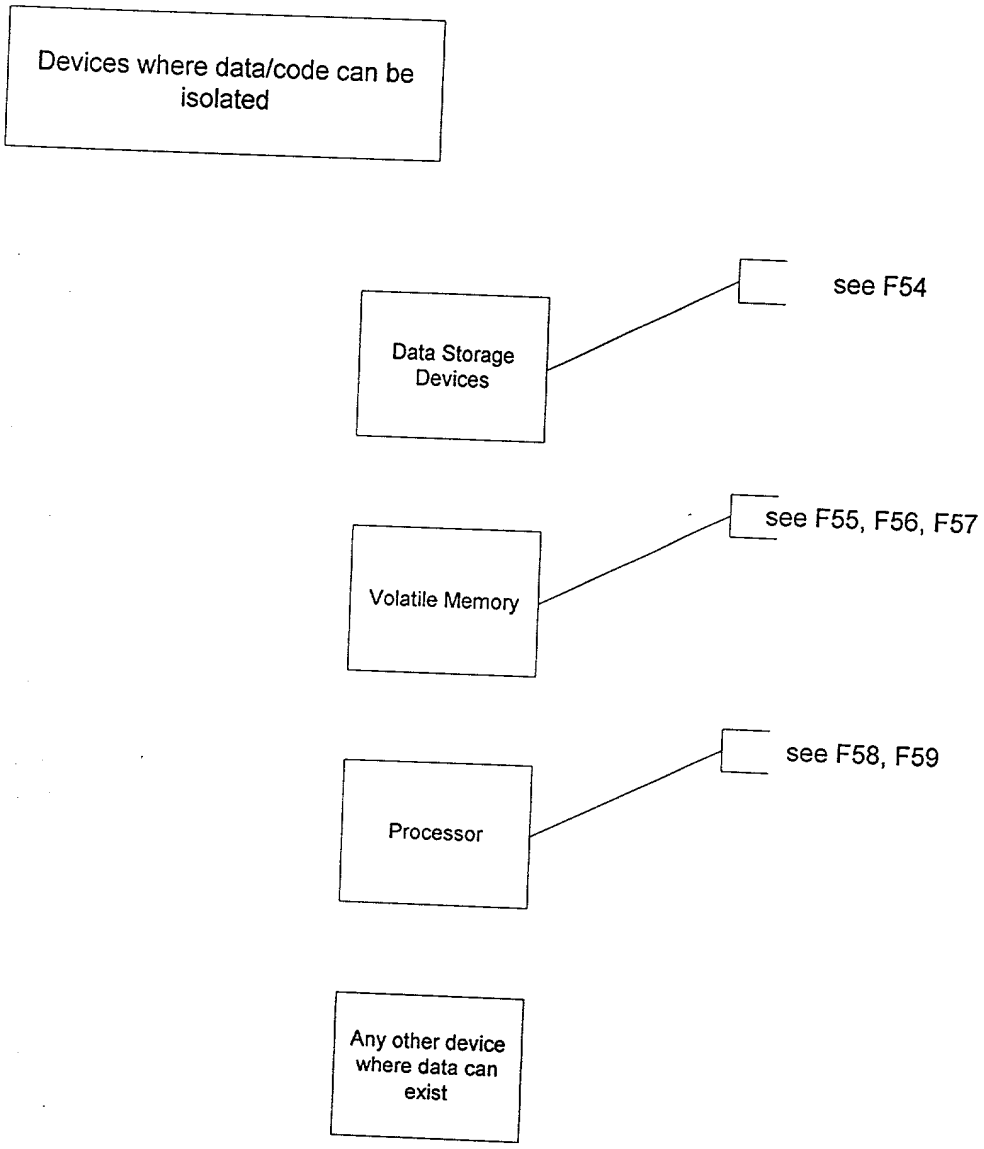
1.) Isolation

Figure F52



2.) Expanded

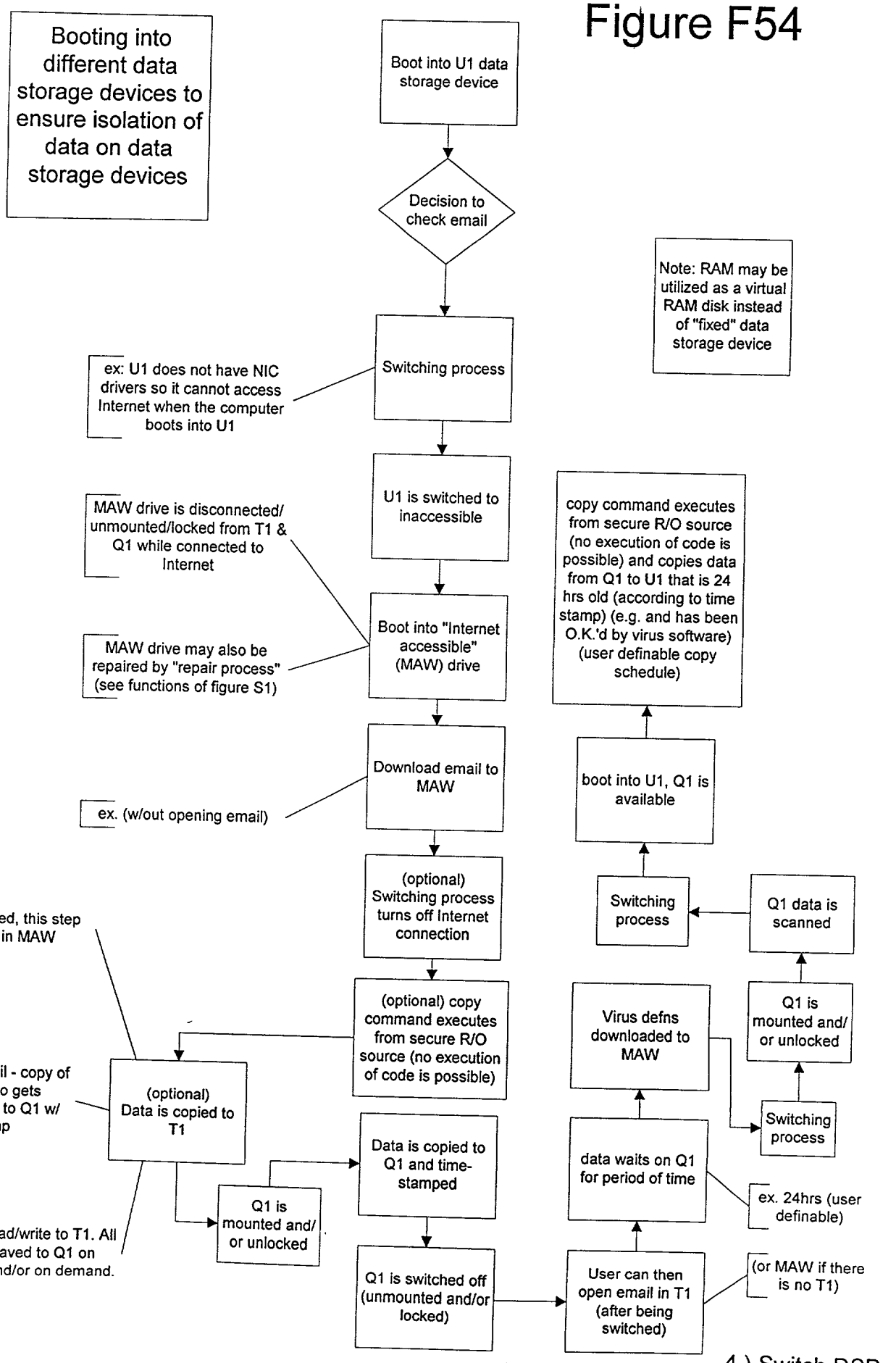
Figure F53



Attorney Docket No. 50277-2000

Figure F54

Booting into different data storage devices to ensure isolation of data on data storage devices



4.) Switch DSDs

Isolating data in volatile memory by "Flushing" volatile memory

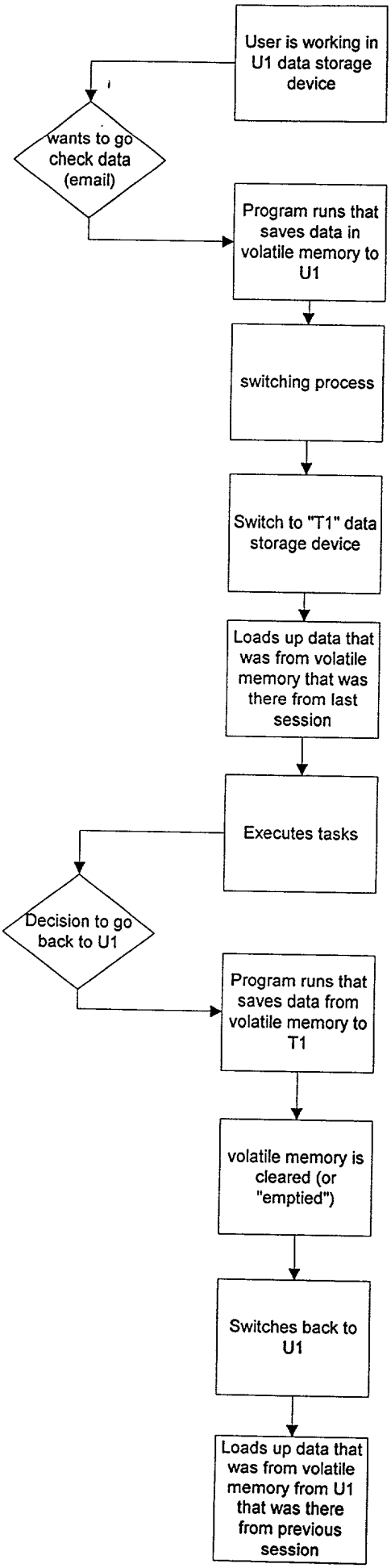


Figure F55

5.) Flush RAM

app-1-ap0-95894v001

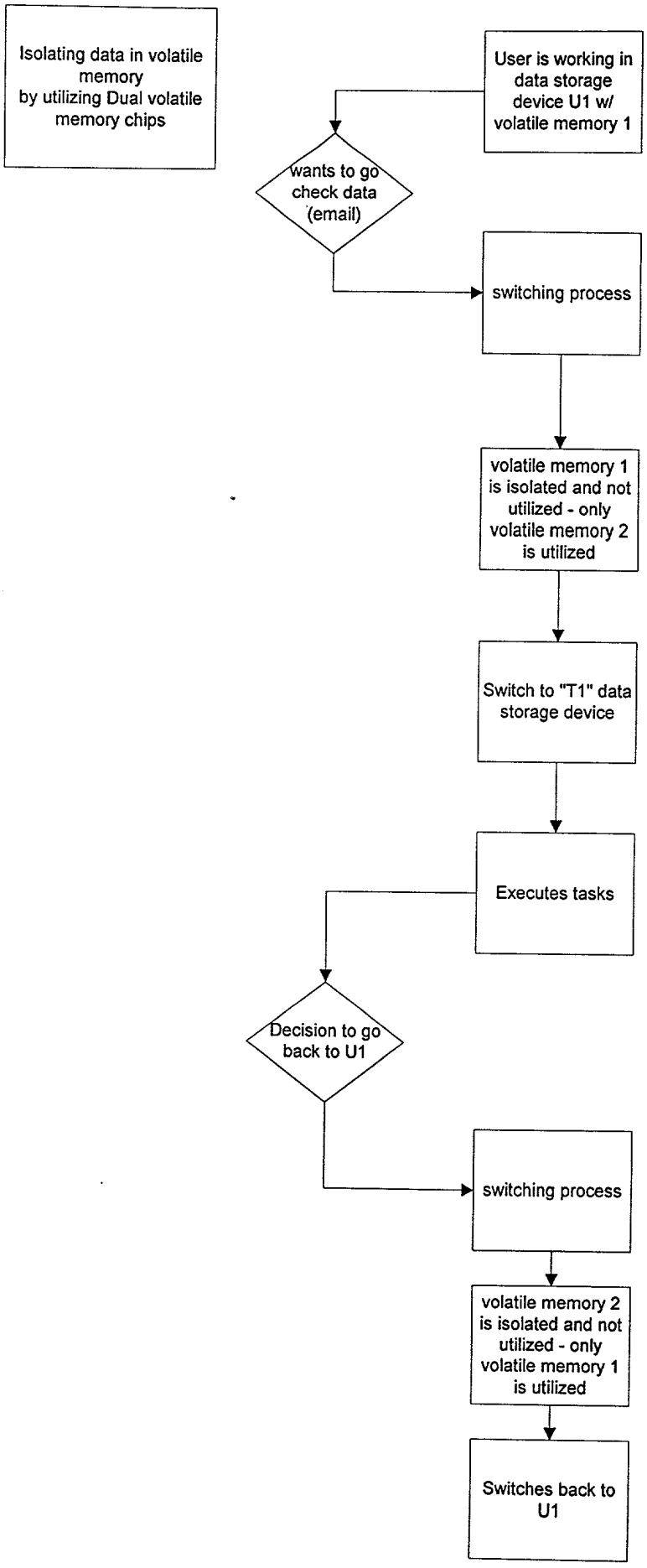


Figure F56

Isolating data in volatile memory by utilizing "protected" segments of volatile memory in 1 volatile memory chip

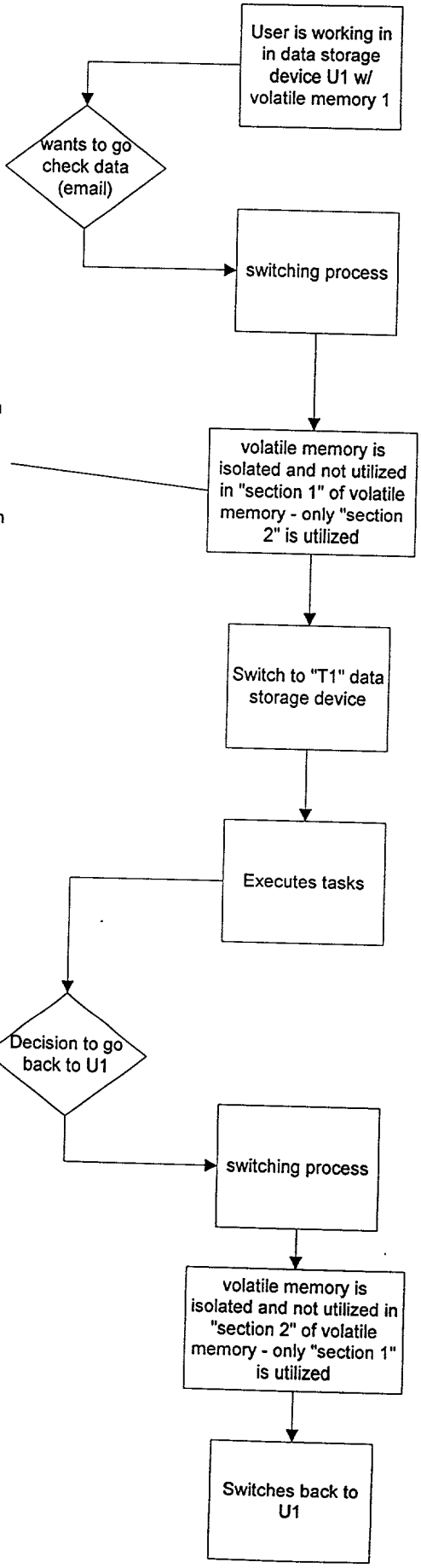


Figure F57

7.) Single RAM - isolated funcs

Isolating data in Processor by utilizing dual processors

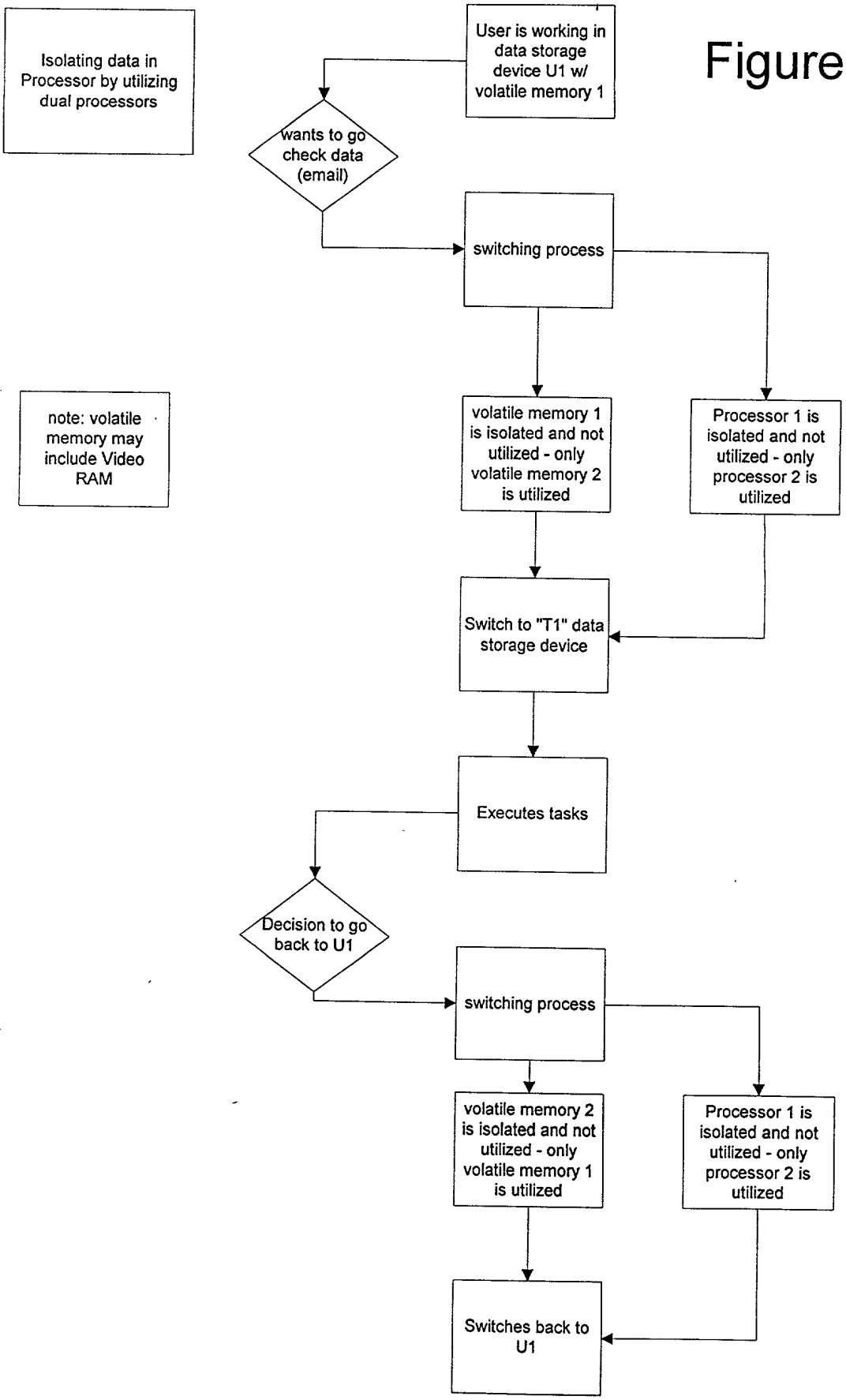


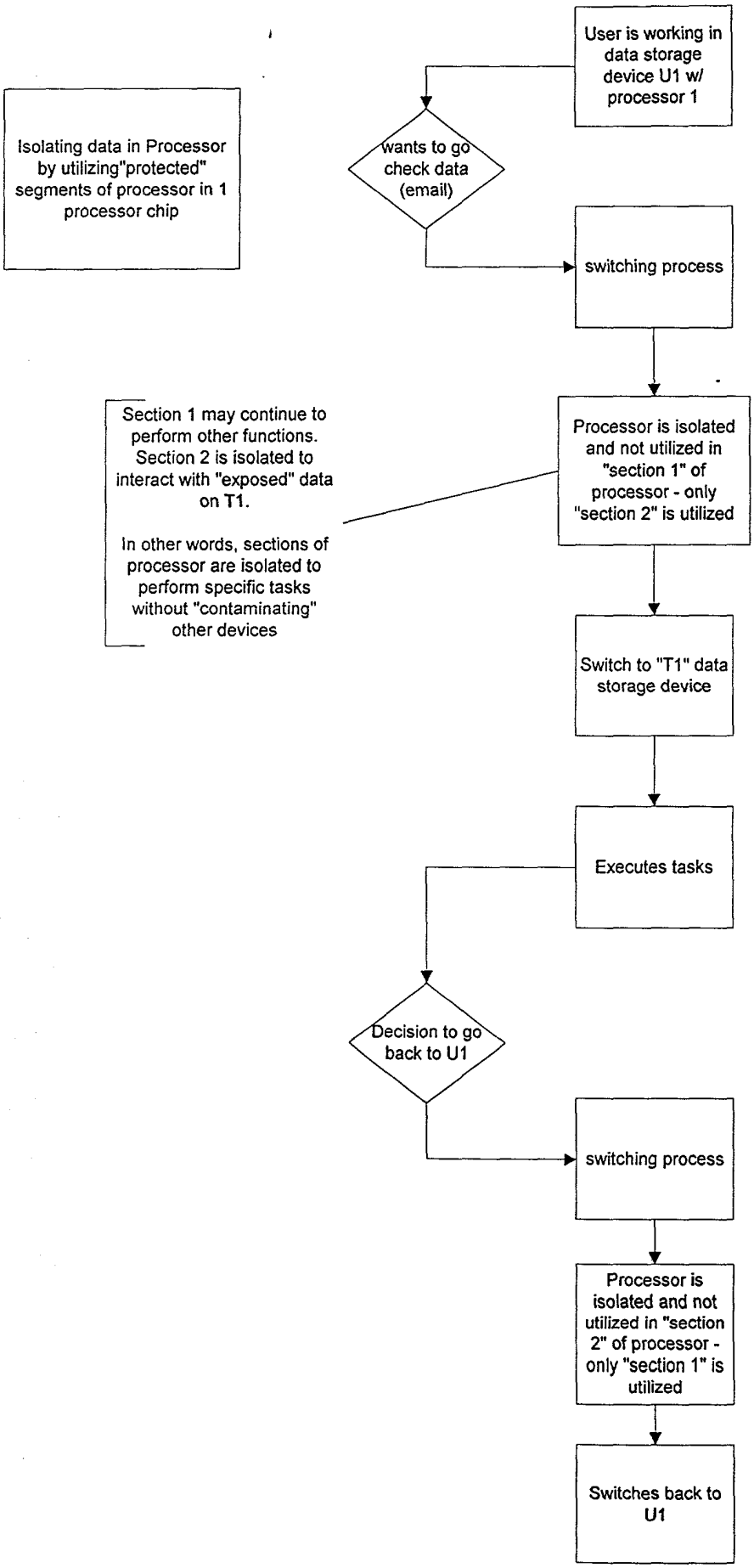
Figure F58

note: volatile memory may include Video RAM

Serial # 09/894,208

Doc 2 - Page 95 of 95

Figure F59



9.) Single Processor "protected"

Patent Application Serial No. 09/893,200

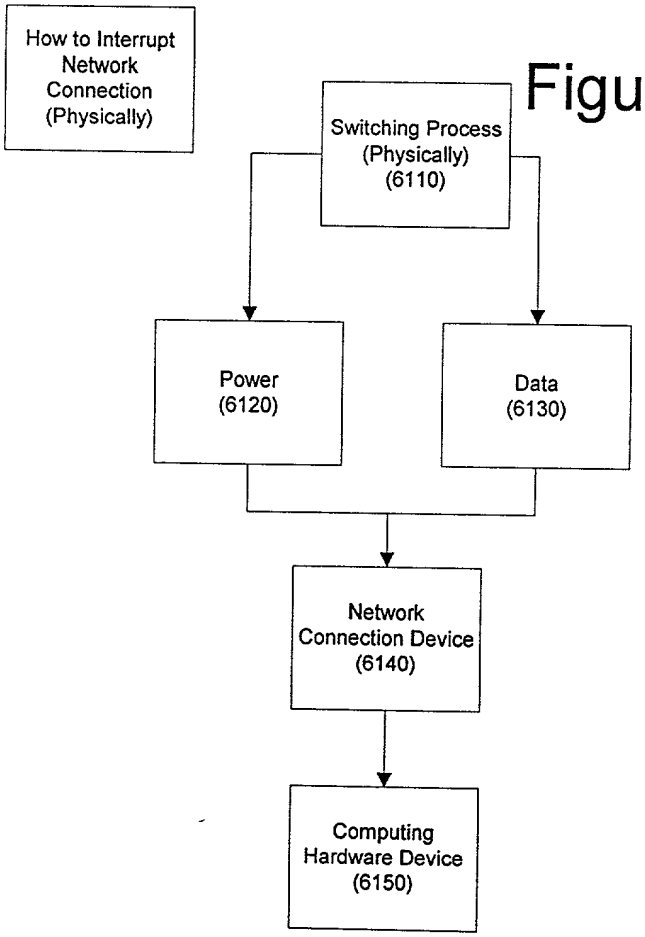


Figure F61

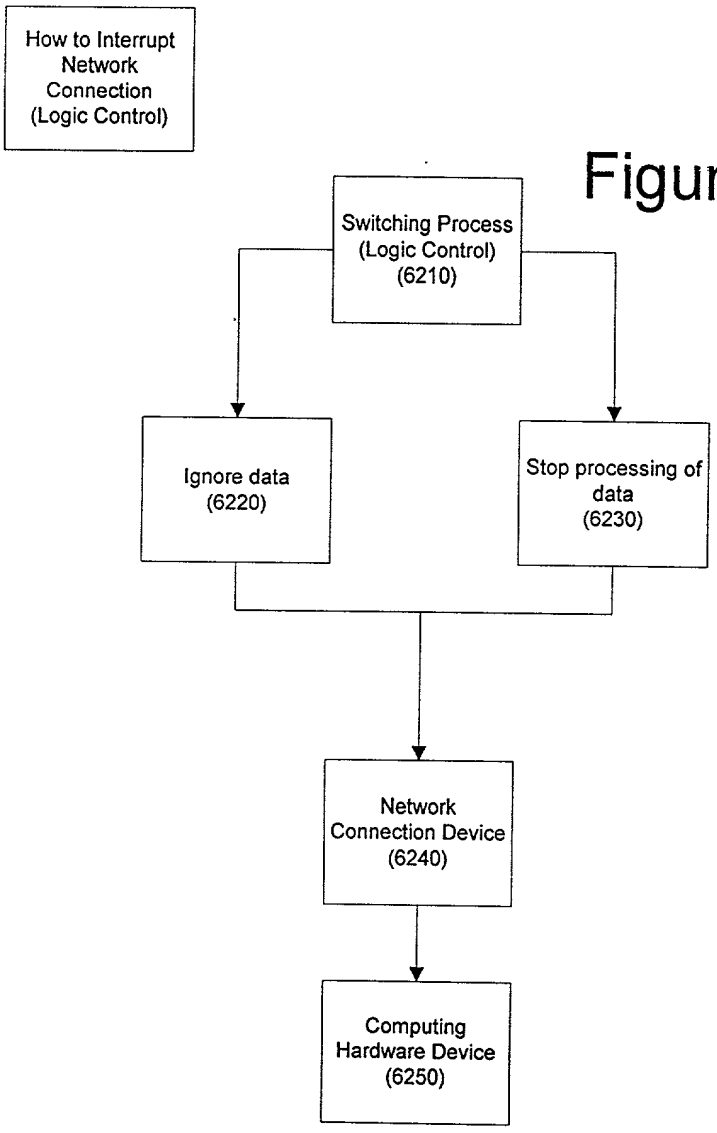


Figure F62

Doc-Pat-09-04-06-v1

Patent Pending

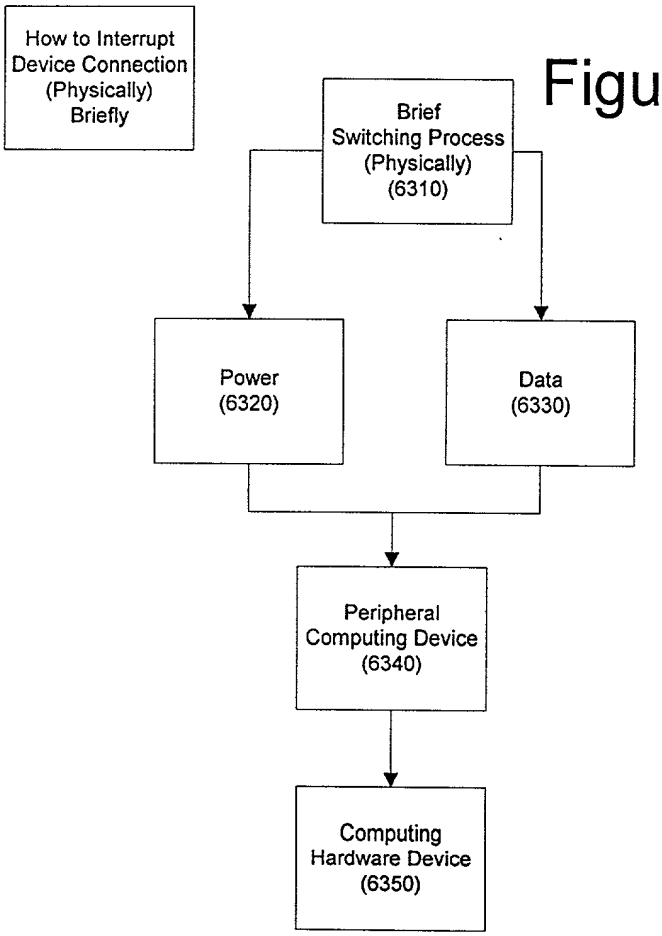


Figure F63

FIGURE F64

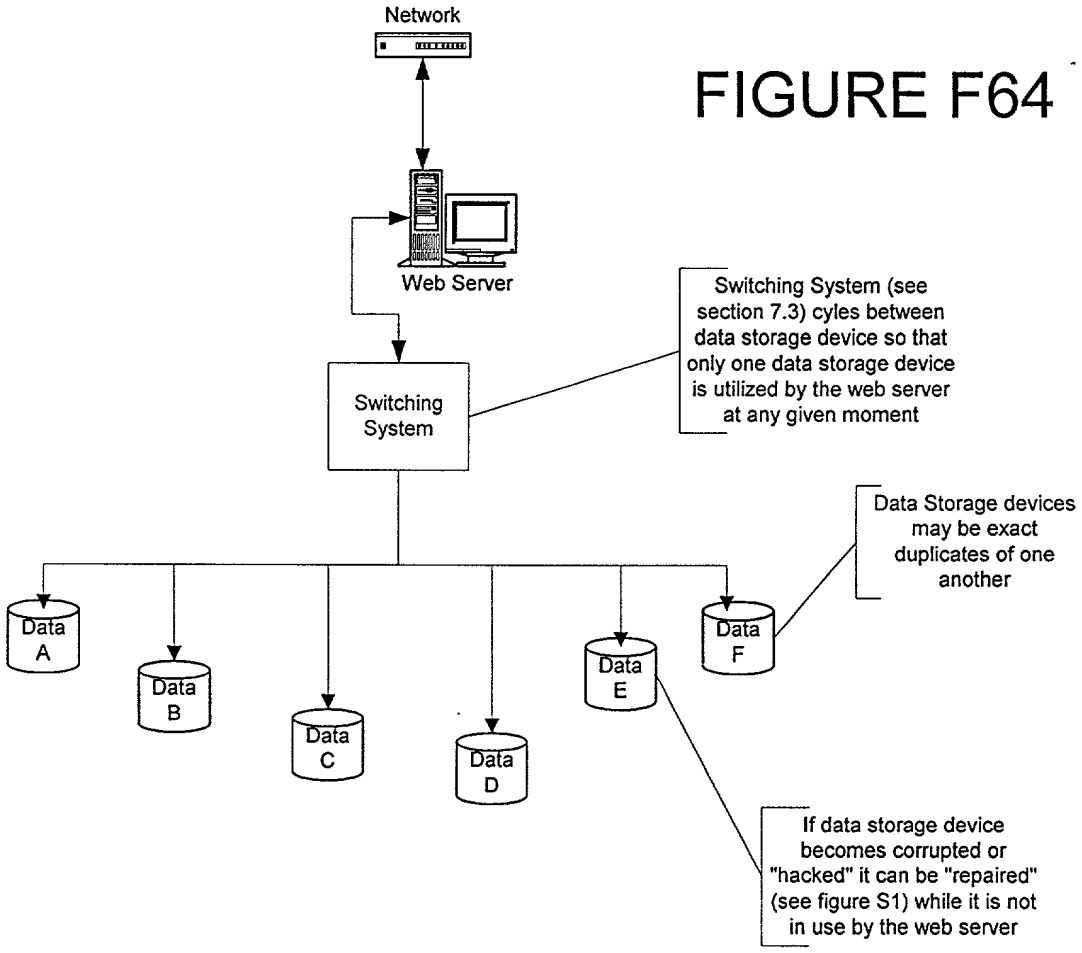

Network
Web Server
Switching System
Switching System (see section 7.3) cyles between data storage device so that only one data storage device is utilized by the web server at any given moment
Data Storage devices may be exact duplicates of one another
Data A
Data B
Data C
Data D
Data E
Data F
If data storage device becomes corrupted or "hacked" it can be "repaired" (see figure S1) while it is not in use by the web server

FIGURE F65

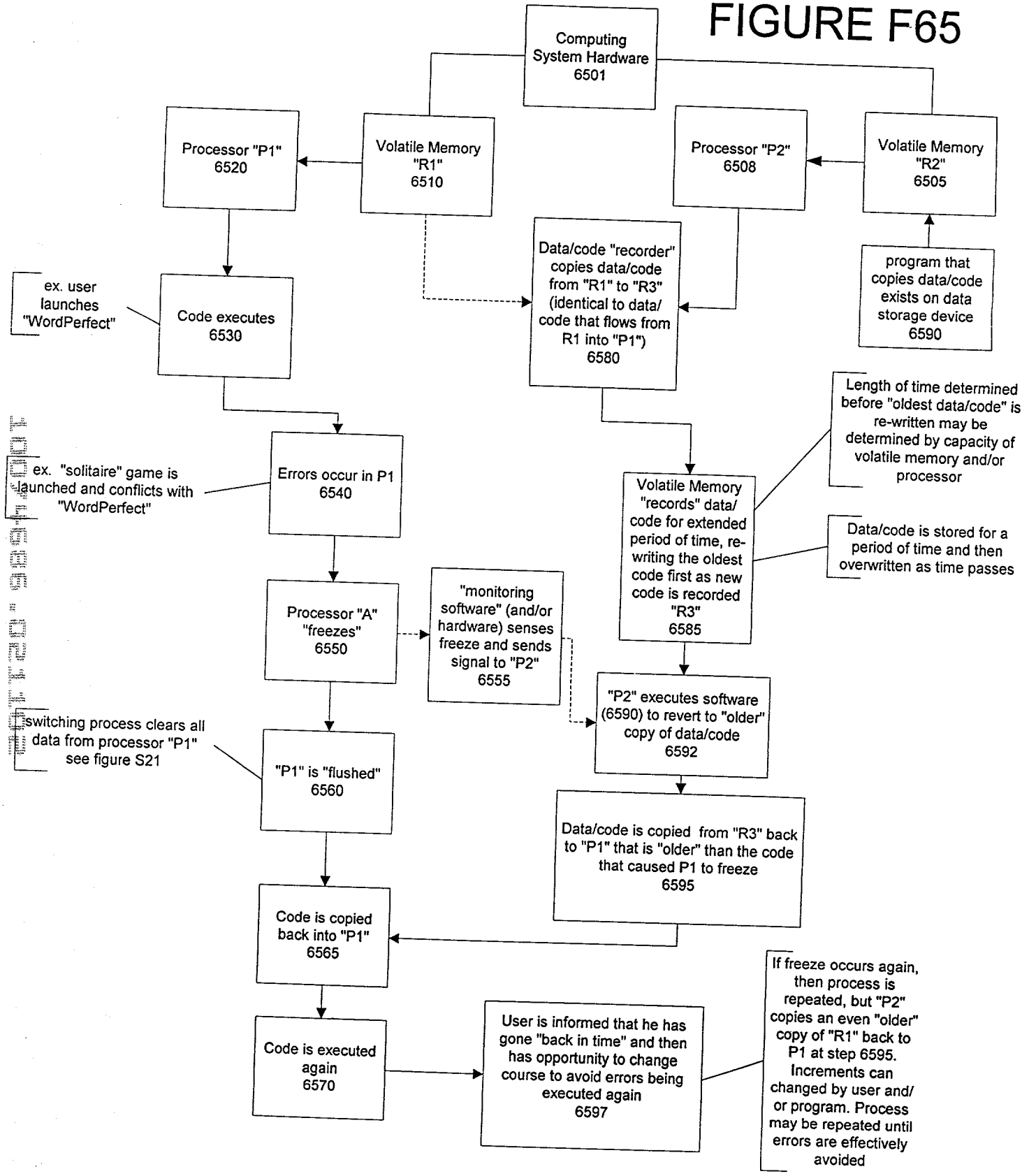
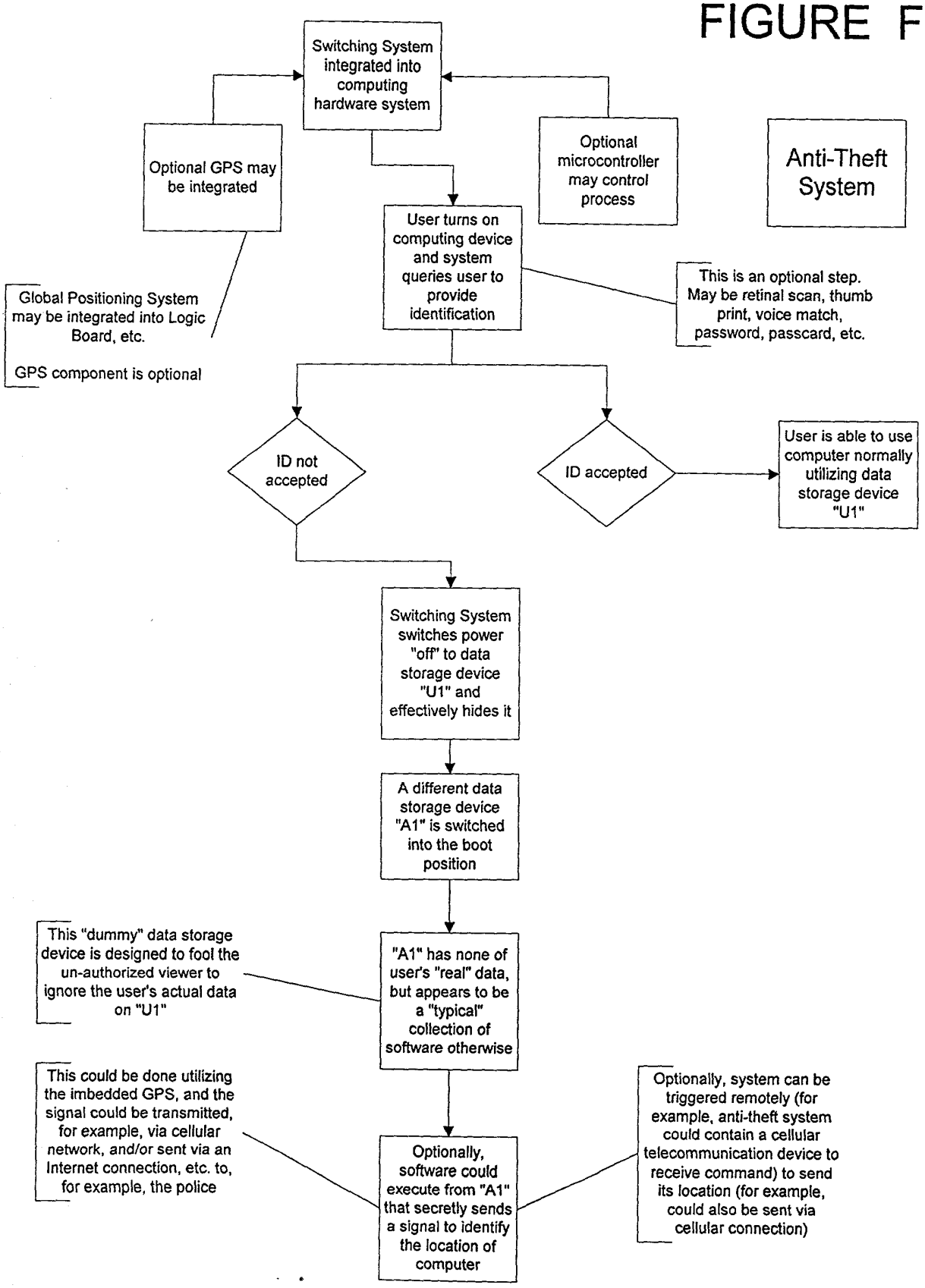

Computing System Hardware 6501
Processor "P1" 6520
Volatile Memory "R1" 6510
Processor "P2" 6508
Volatile Memory "R2" 6505
program that copies data/code exists on data storage device 6590
Data/code "recorder" copies data/code from "R1" to "R3" (identical to data/code that flows from R1 into "P1") 6580
ex. user launches "WordPerfect"
Code executes 6530
Length of time determined before "oldest data/code" is re-written may be determined by capacity of volatile memory and/or processor
ex. "solitaire" game is launched and conflicts with "WordPerfect"
Errors occur in P1 6540
Volatile Memory "records" data/code for extended period of time, re-writing the oldest code first as new code is recorded "R3" 6585
Data/code is stored for a period of time and then overwritten as time passes
Processor "A" "freezes" 6550
"monitoring software" (and/or hardware) senses freeze and sends signal to "P2" 6555
"P2" executes software (6590) to revert to "older" copy of data/code 6592
switching process clears all data from processor "P1" see figure S21
"P1" is "flushed" 6560
Data/code is copied from "R3" back to "P1" that is "older" than the code that caused P1 to freeze 6595
Code is copied back into "P1" 6565
Code is executed again 6570
User is informed that he has gone "back in time" and then has opportunity to change course to avoid errors being executed again 6597
If freeze occurs again, then process is repeated, but "P2" copies an even "older" copy of "R1" back to P1 at step 6595. Increments can changed by user and/or program. Process may be repeated until errors are effectively avoided

FIGURE F66



US 2004/0049694 A1

Sheet 1 of 10

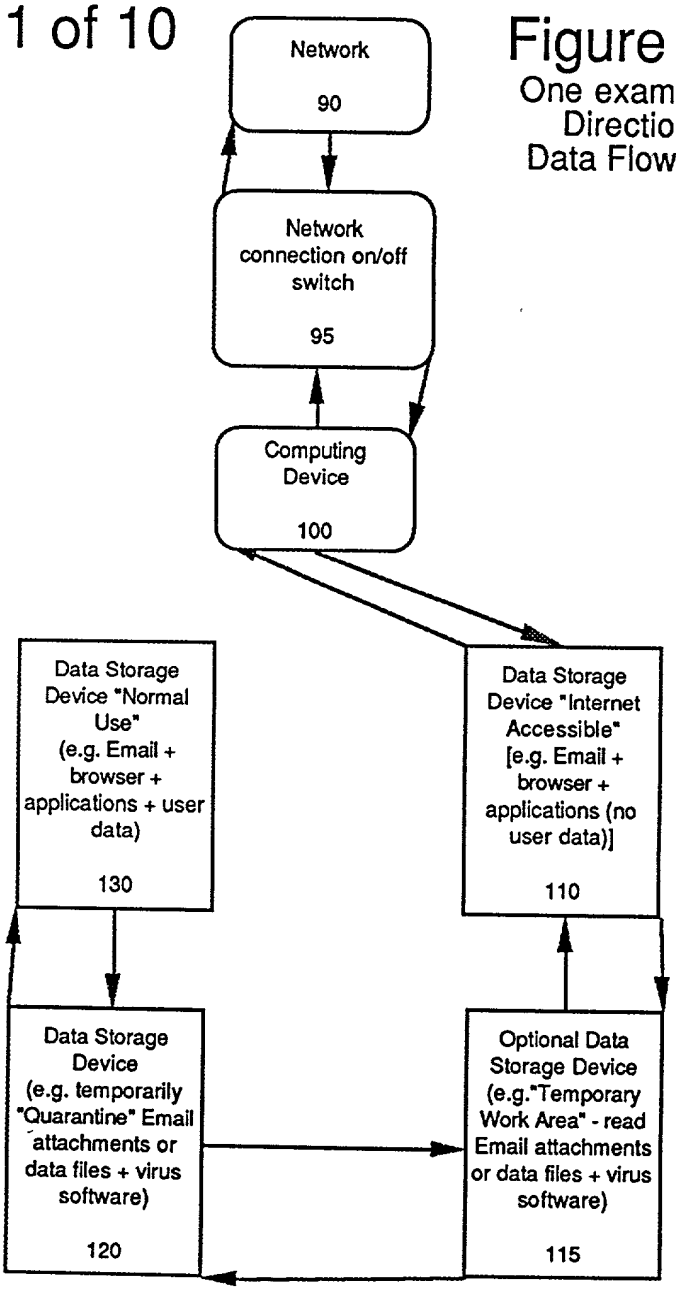
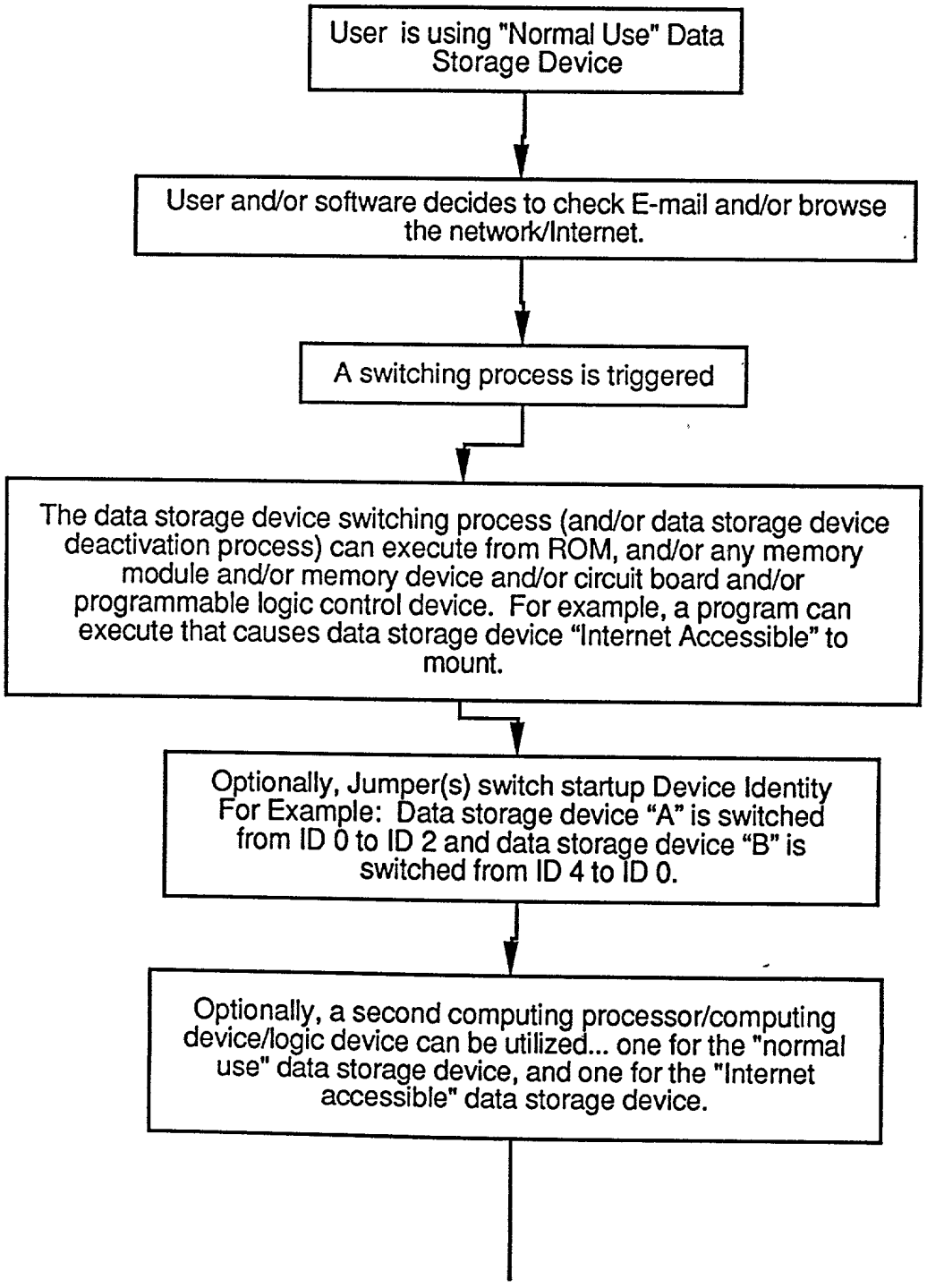


Figure F90
One example of Directional Data Flow Path

Attorney Docket No. 50004.0001

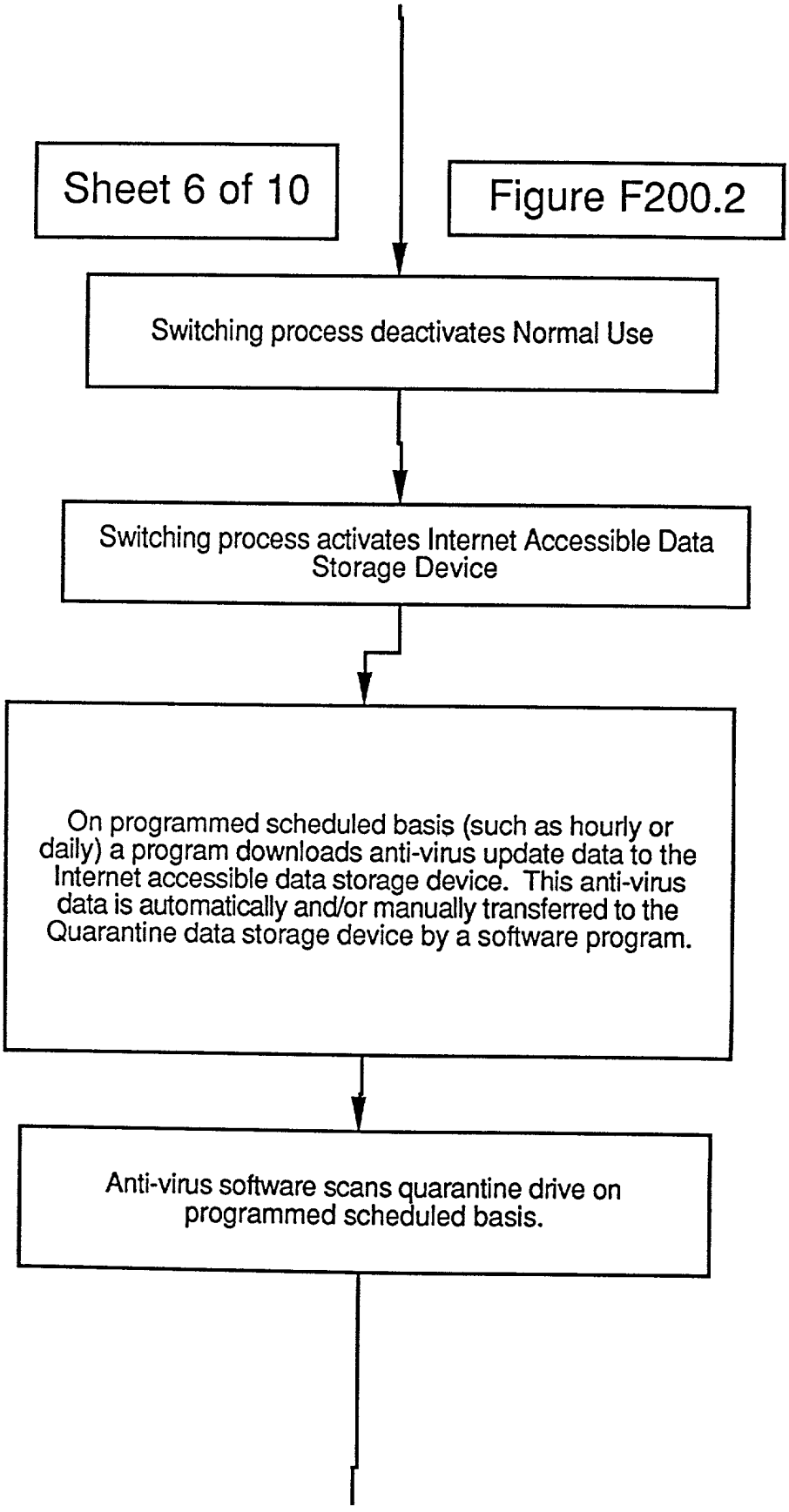
Sheet 5 of 10

Figure F200.1



Sheet 6 of 10

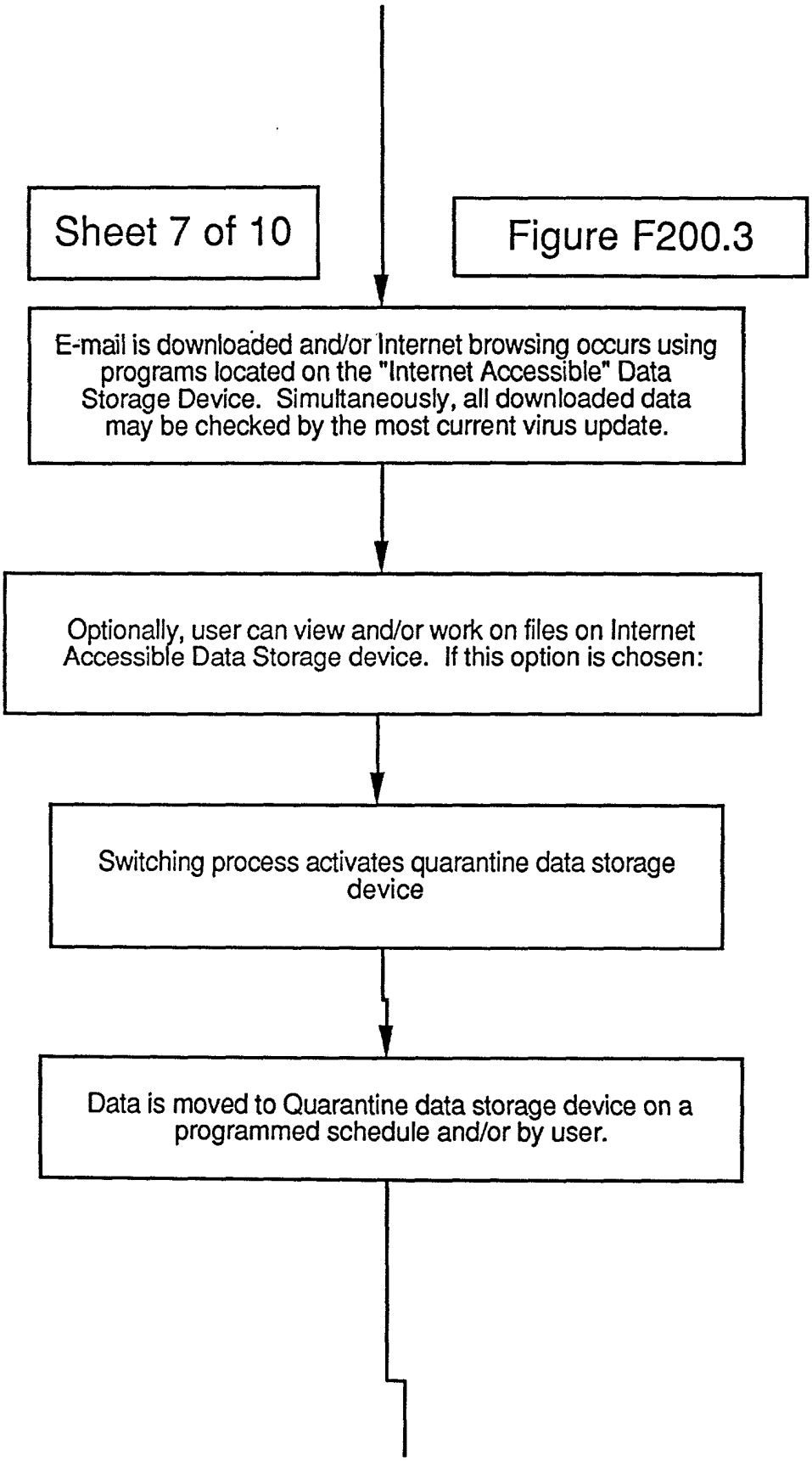
Figure F200.2



Doc 4565 - 05/17/05

Sheet 7 of 10

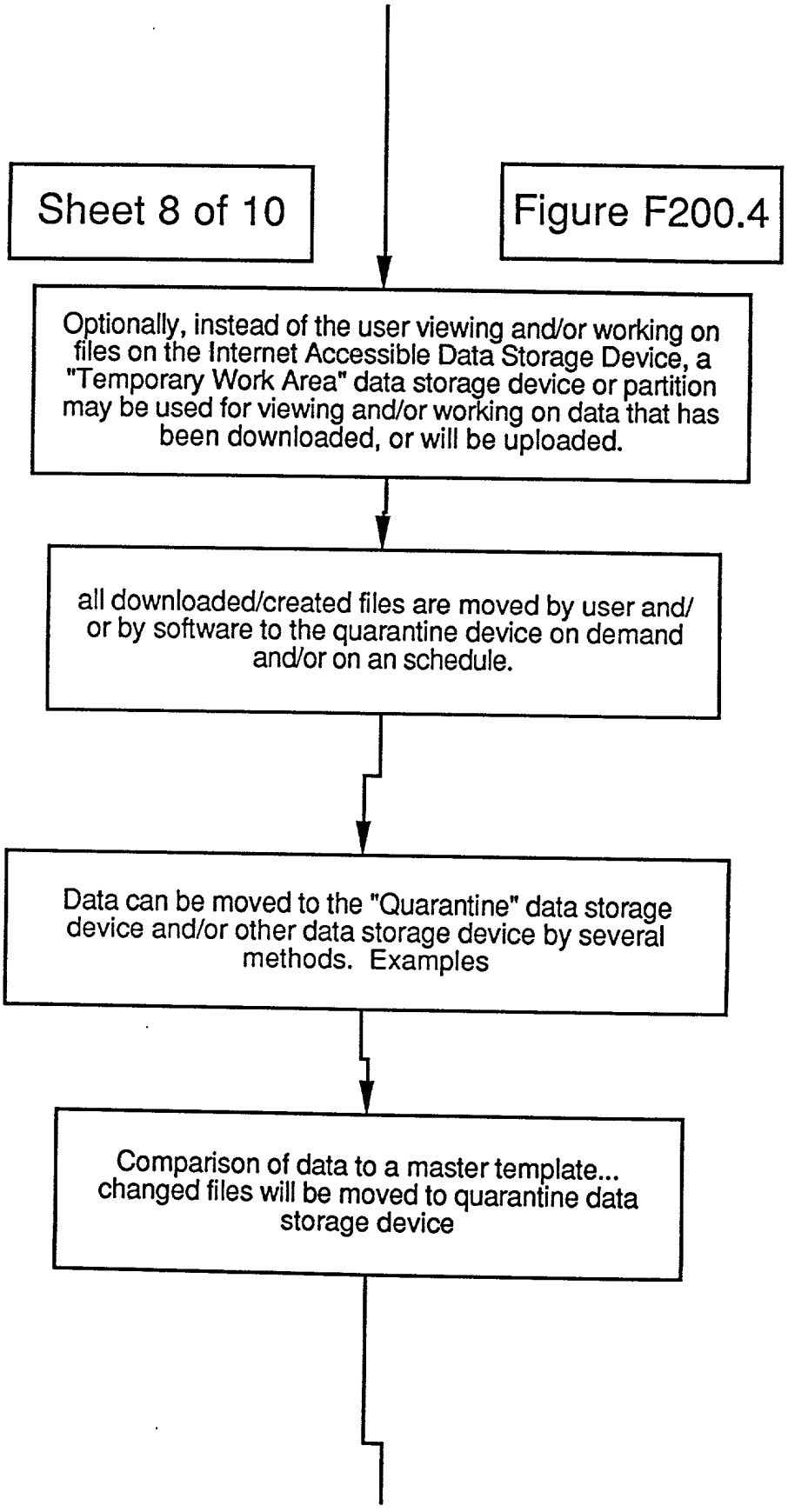
Figure F200.3



Doc. 1 Page 7 of 10

Sheet 8 of 10

Figure F200.4



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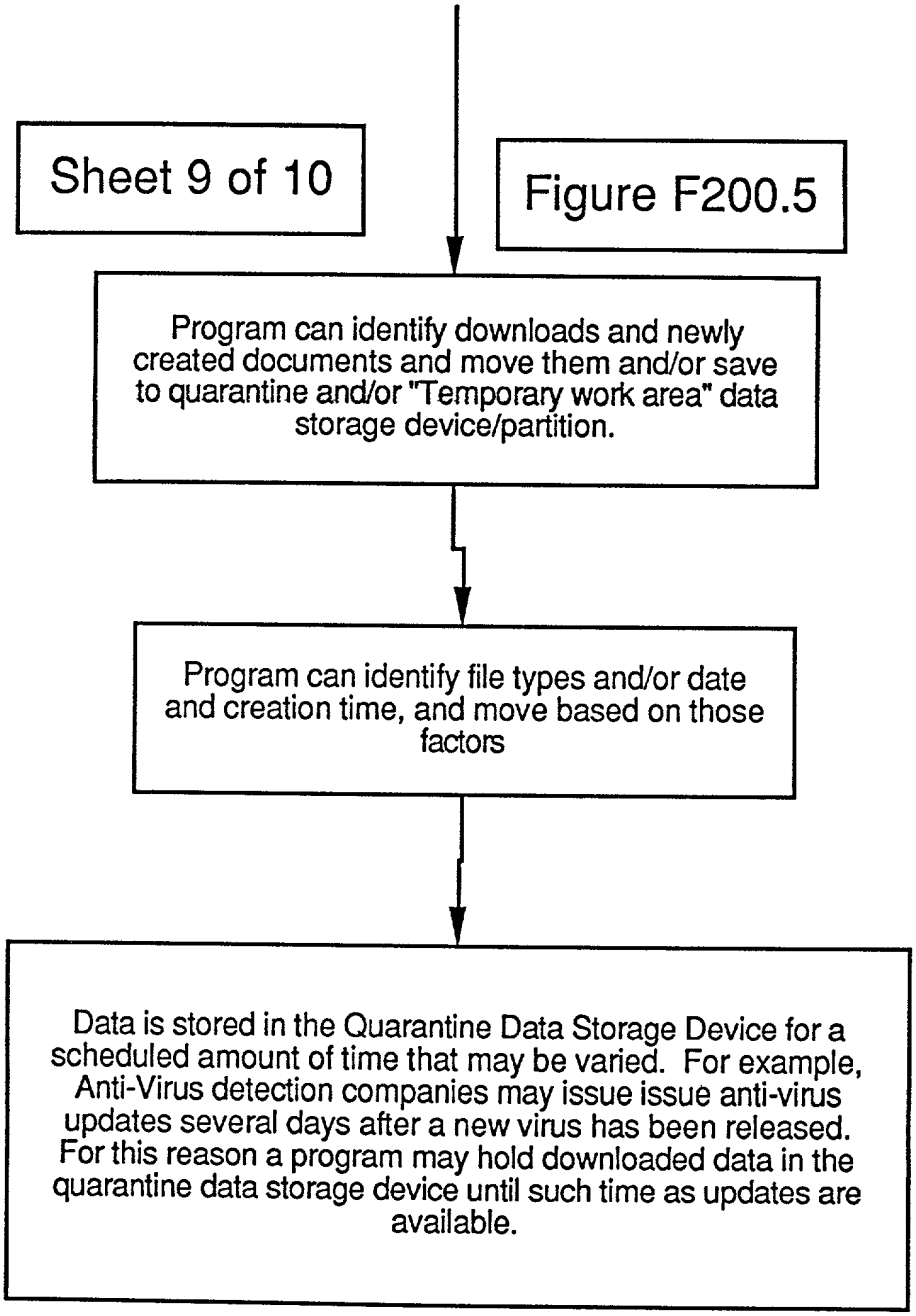
Sheet 9 of 10

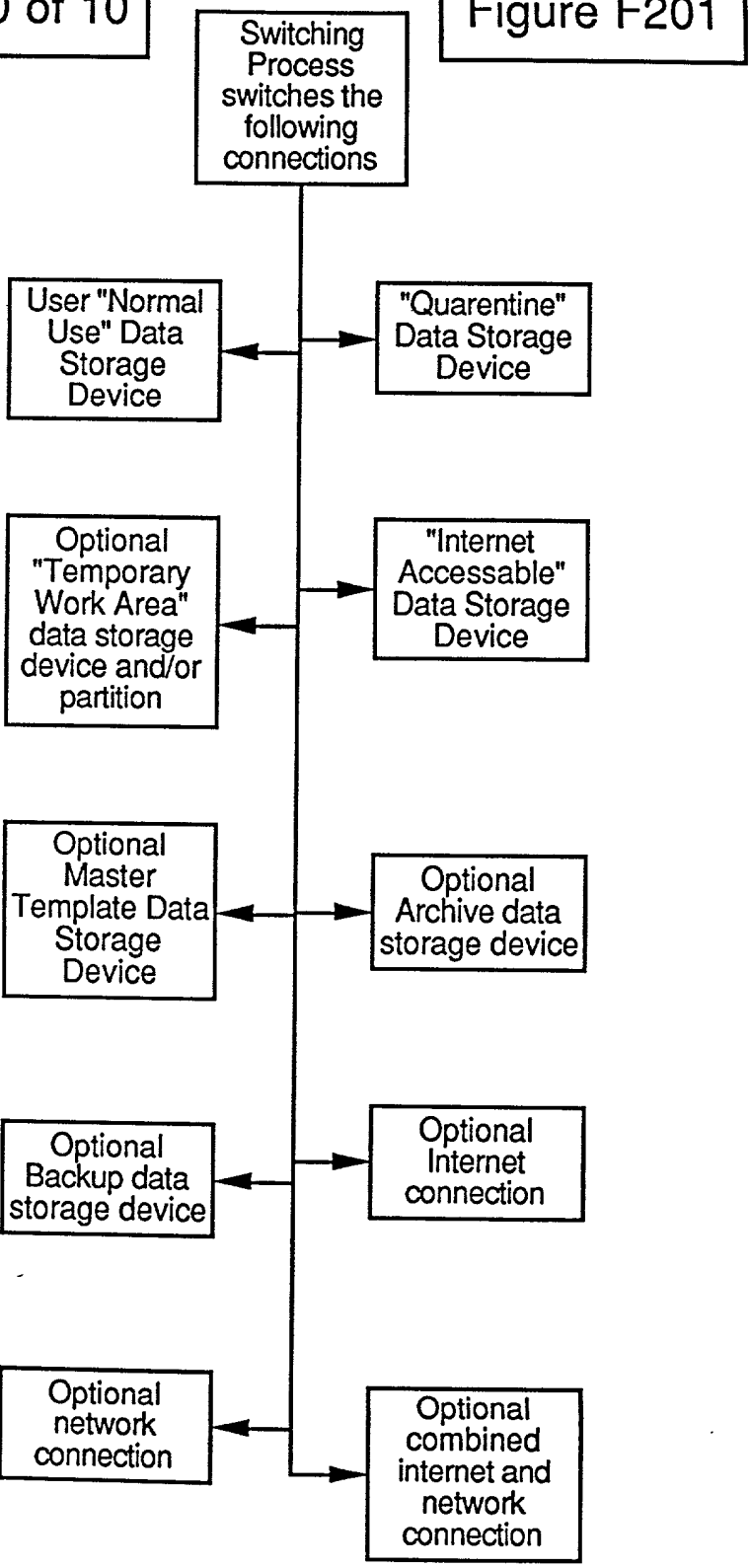
Figure F200.5



Google Exhibit 1009
Page 9 of 10

Sheet 10 of 10

Figure F201



Serial No. 09/964,126

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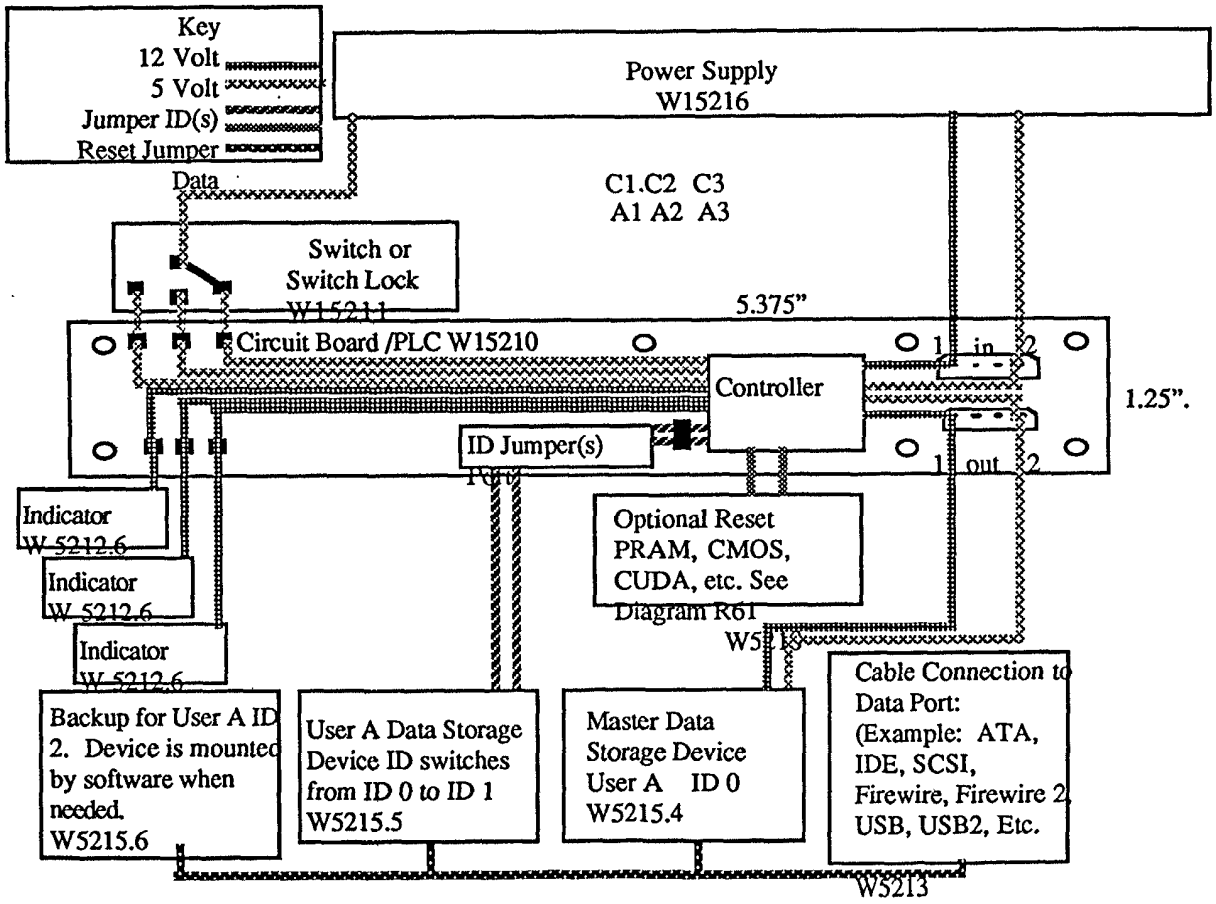

DRAMUS Figure W40
Single-User & Repair

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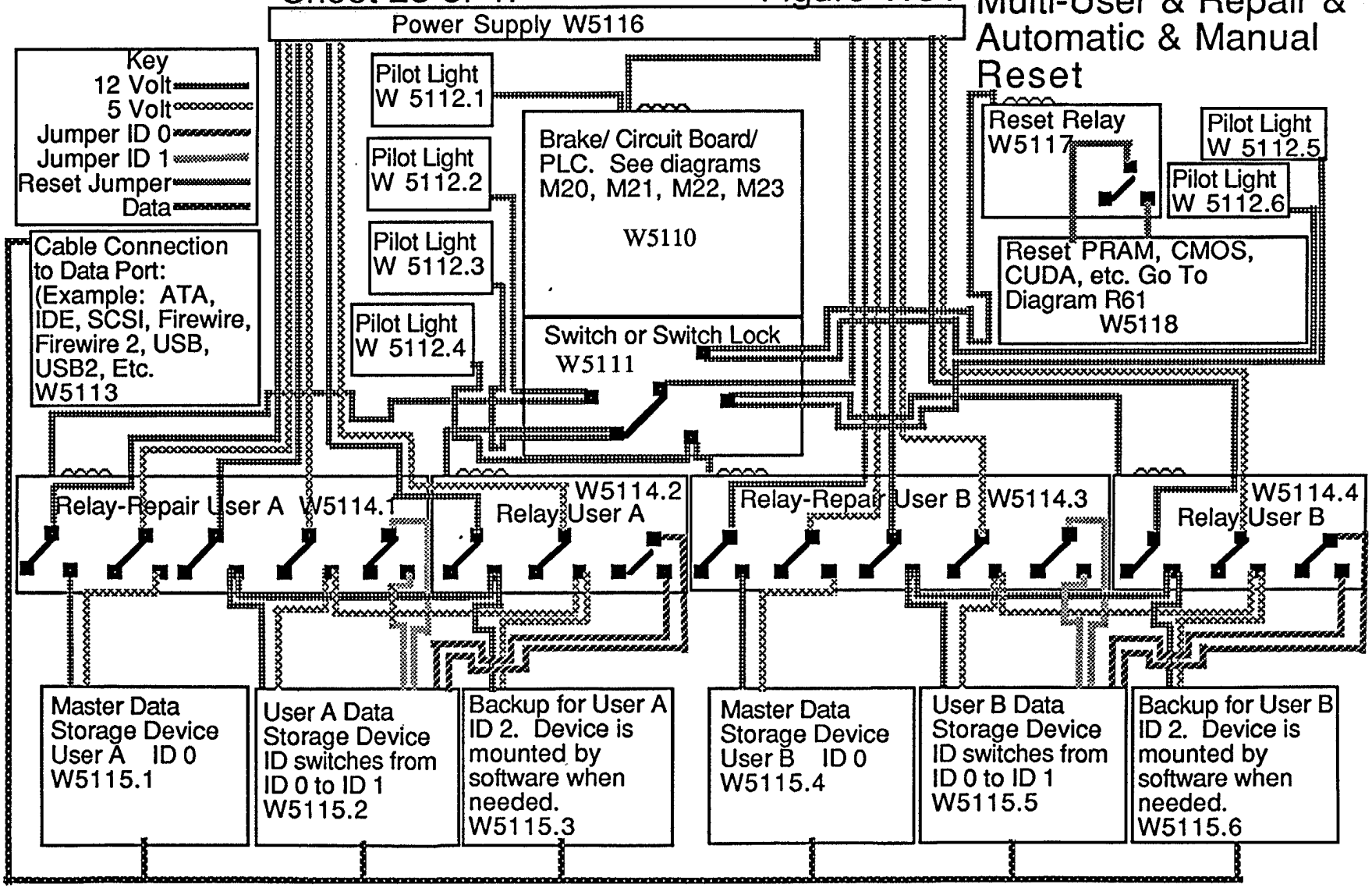
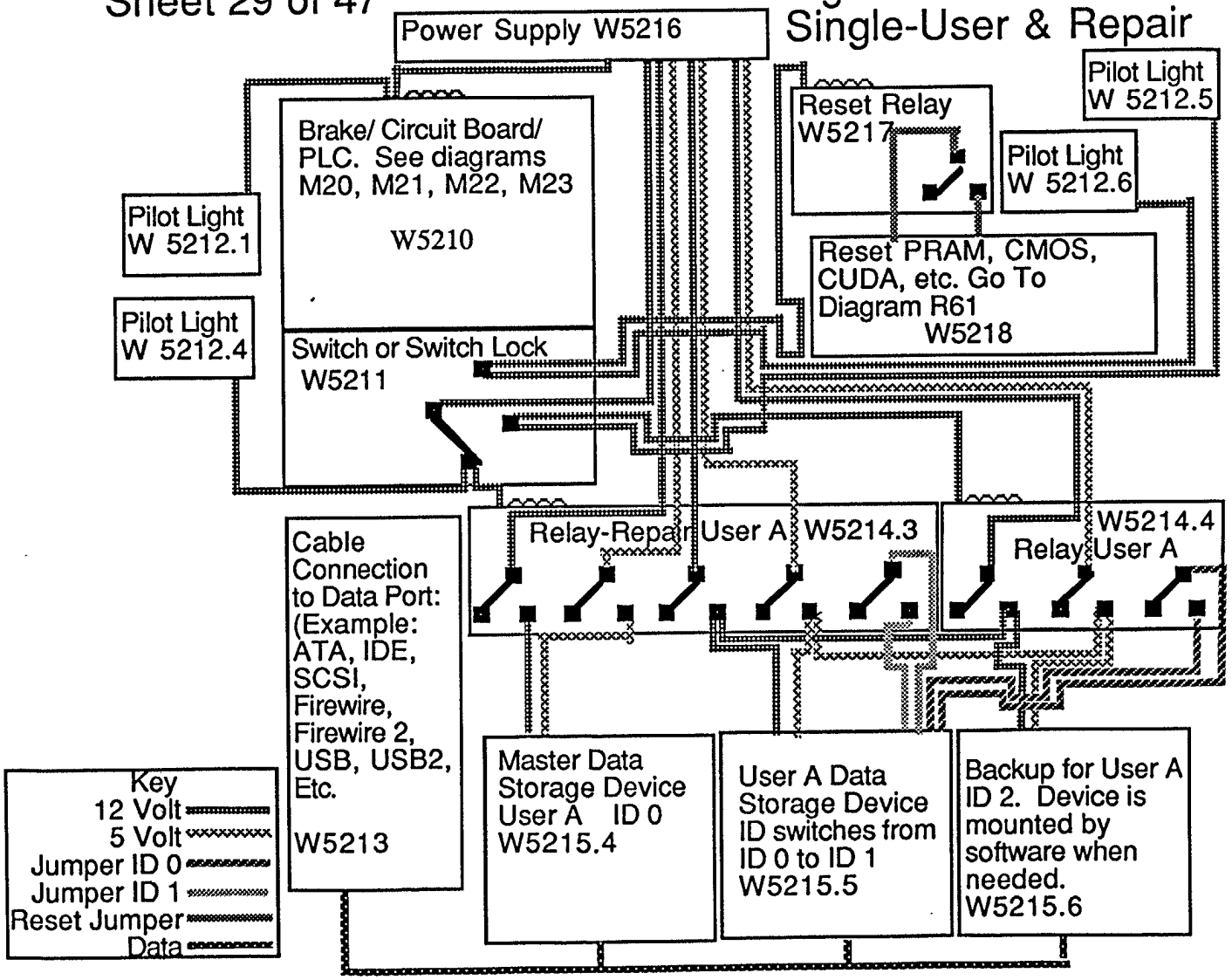
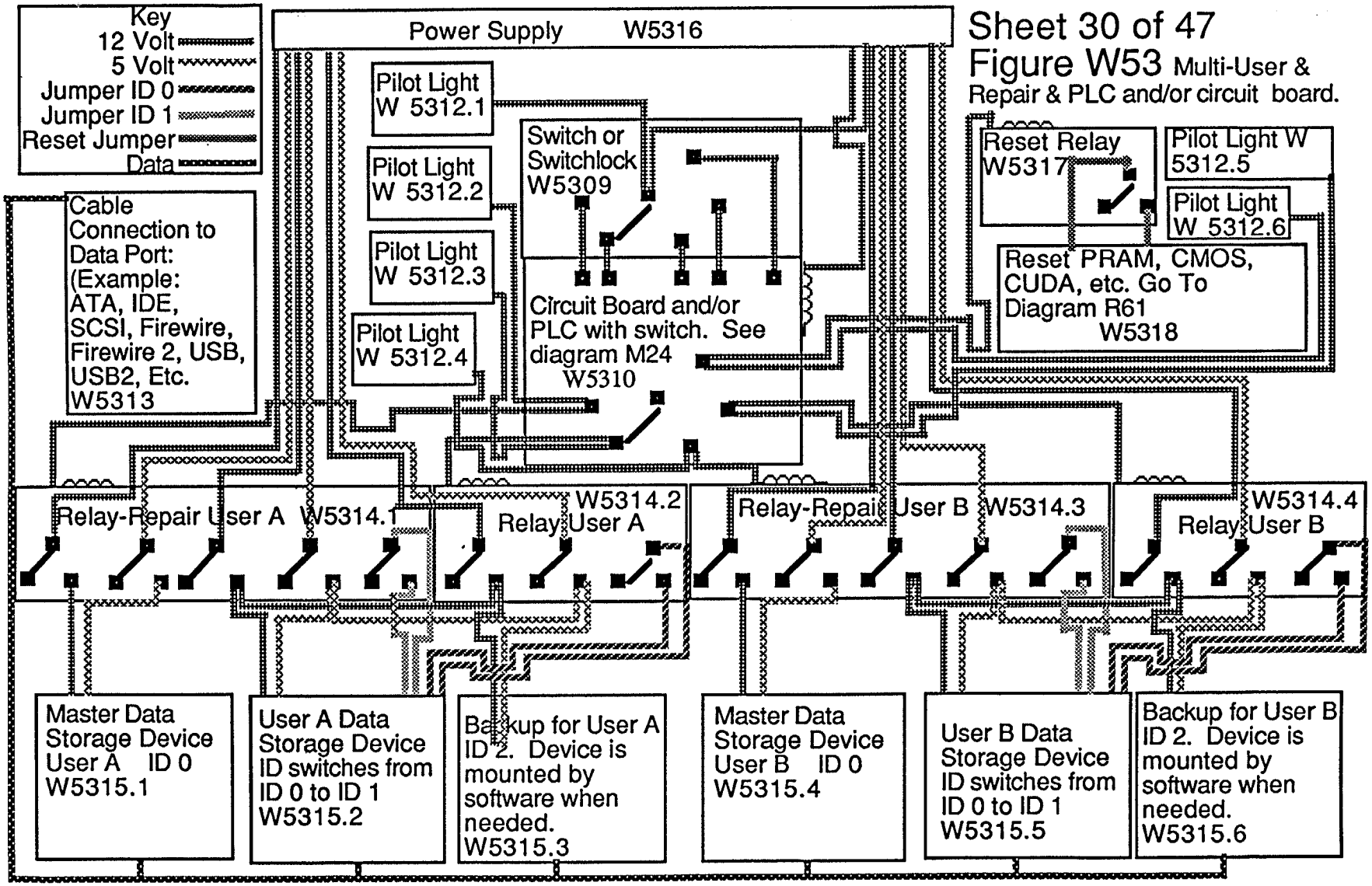
Figure W51 Multi-User & Repair & Automatic & Manual Reset



20T20 989h200T

Figure W52
Single-User & Repair

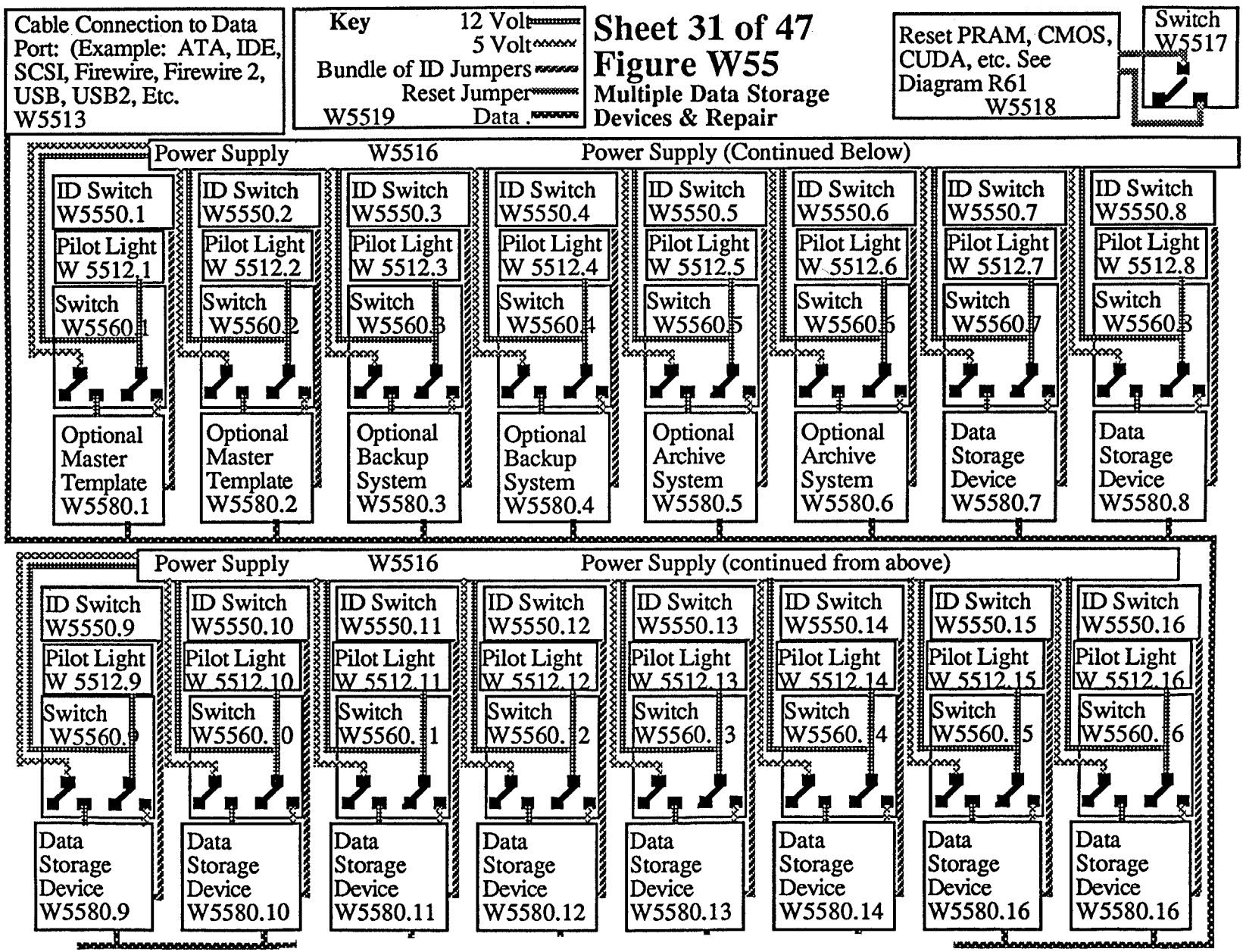




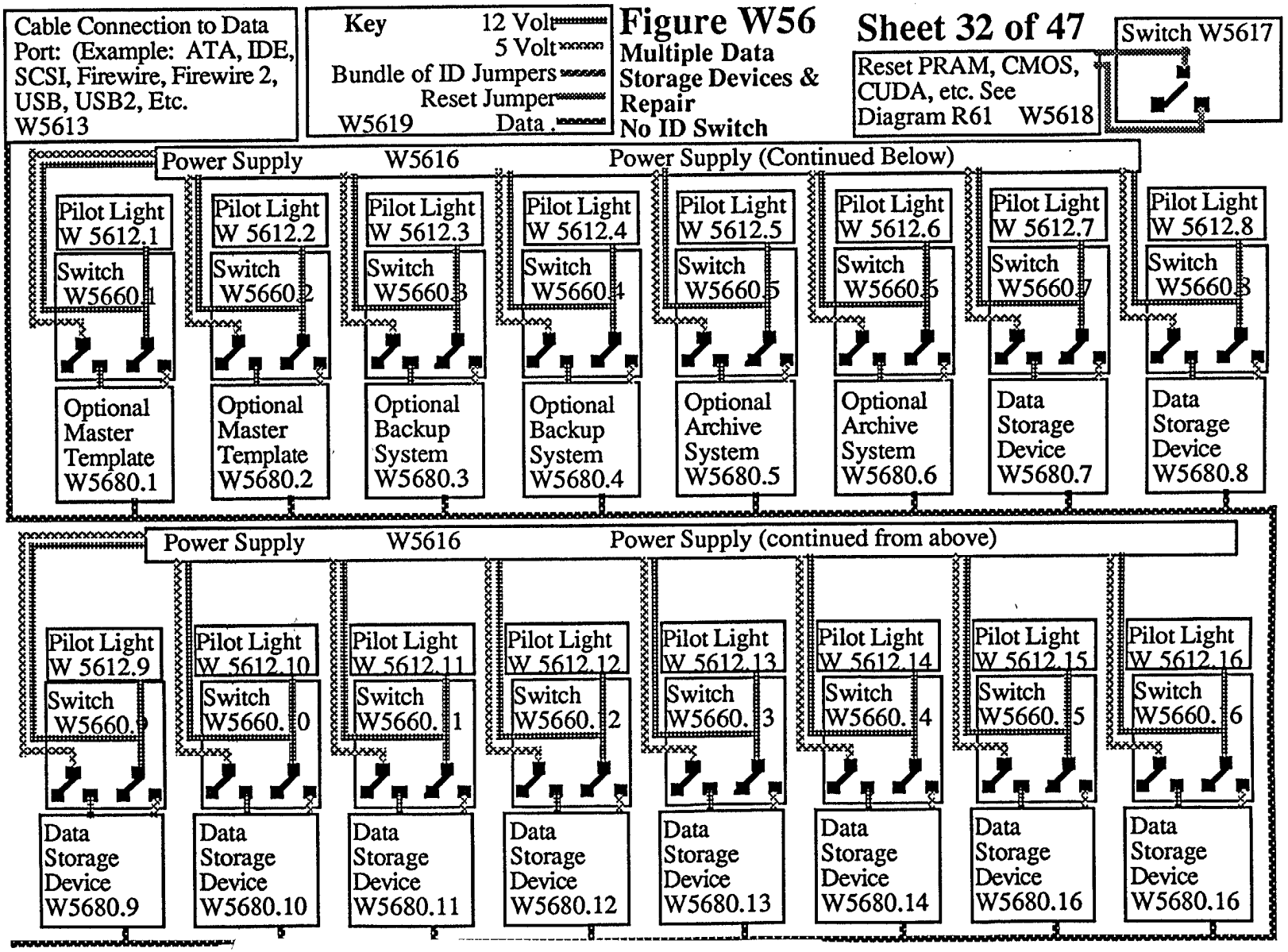
Sheet 30 of 47

Figure W53 Multi-User & Repair & PLC and/or circuit board.

20T20" 989h200F



20T120" 989h200T



20120989h2007

Cable Connection to Data Port: (Example: ATA, IDE, SCSI, Firewire, Firewire 2, USB, USB2, Etc. Bus 1 W5713

Key
12 Volt
5 Volt
Bundle of ID Jumpers
Reset Jumper
W5719 Data

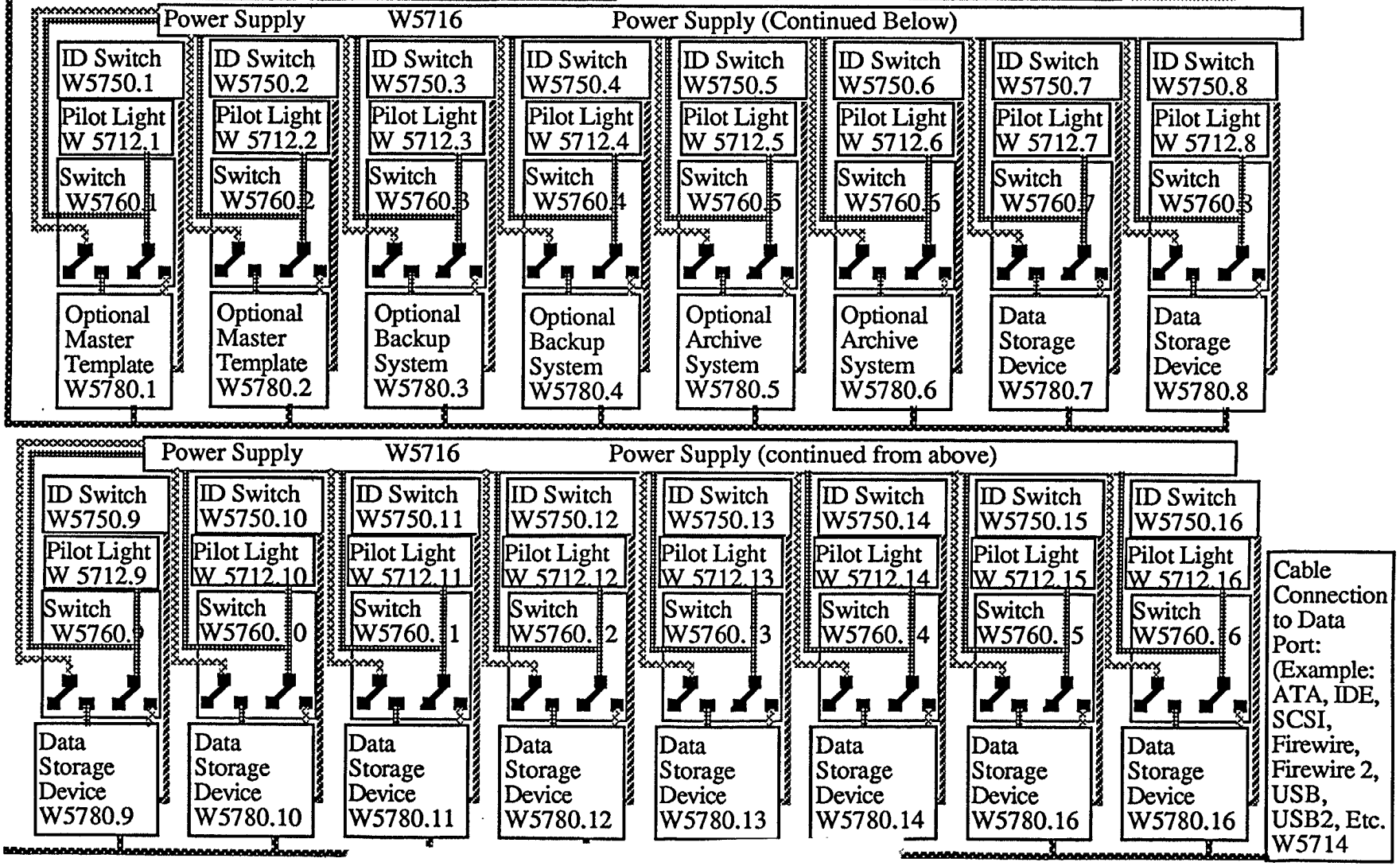
Sheet 33 of 47

Figure W57

Multiple Data Storage Devices & Repair

Reset PRAM, CMOS, CUDA, etc. See Diagram R61 W5718

Switch W5717



20T20 989h7007

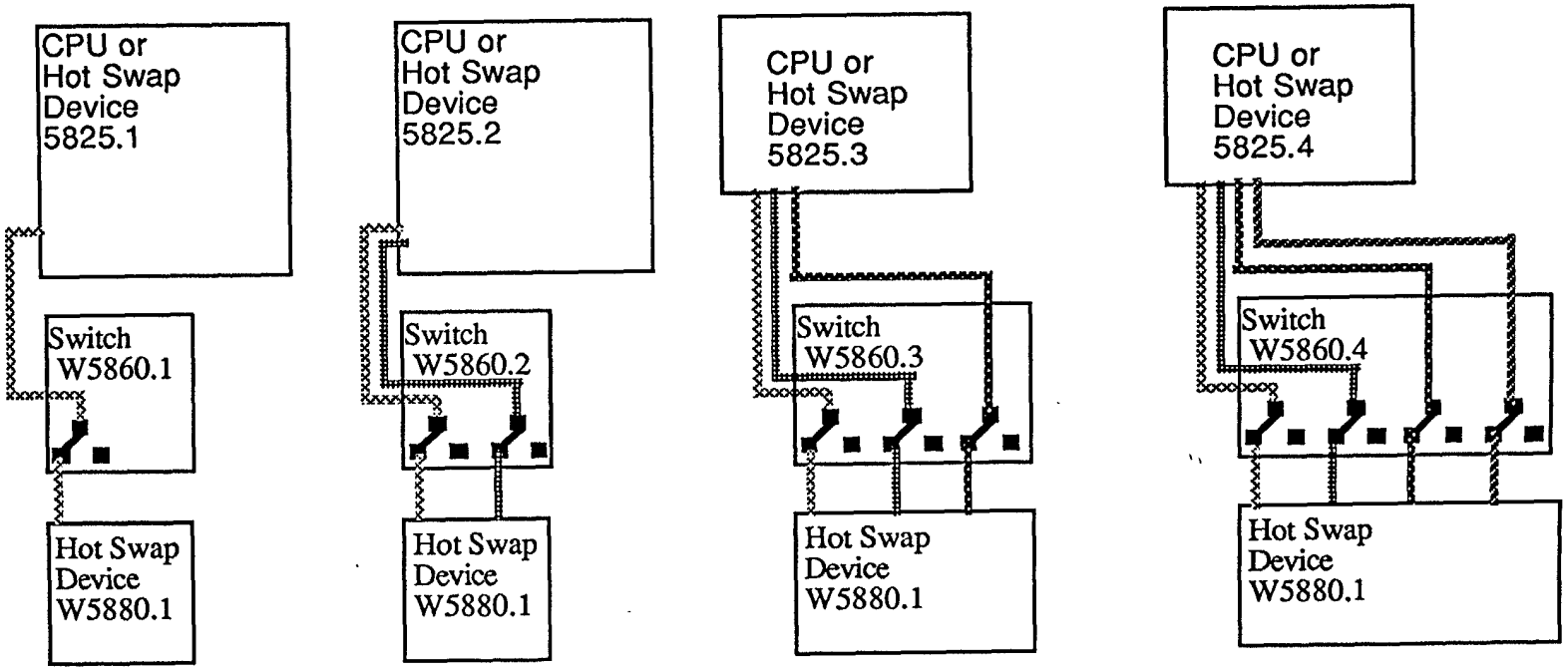
Figure W58

Key
Wire #1
Wire #2
Wire #3
Wire #4
W5819 Reset Jumper

DRAMUS
Figure W58
Reset Hot Swap Device

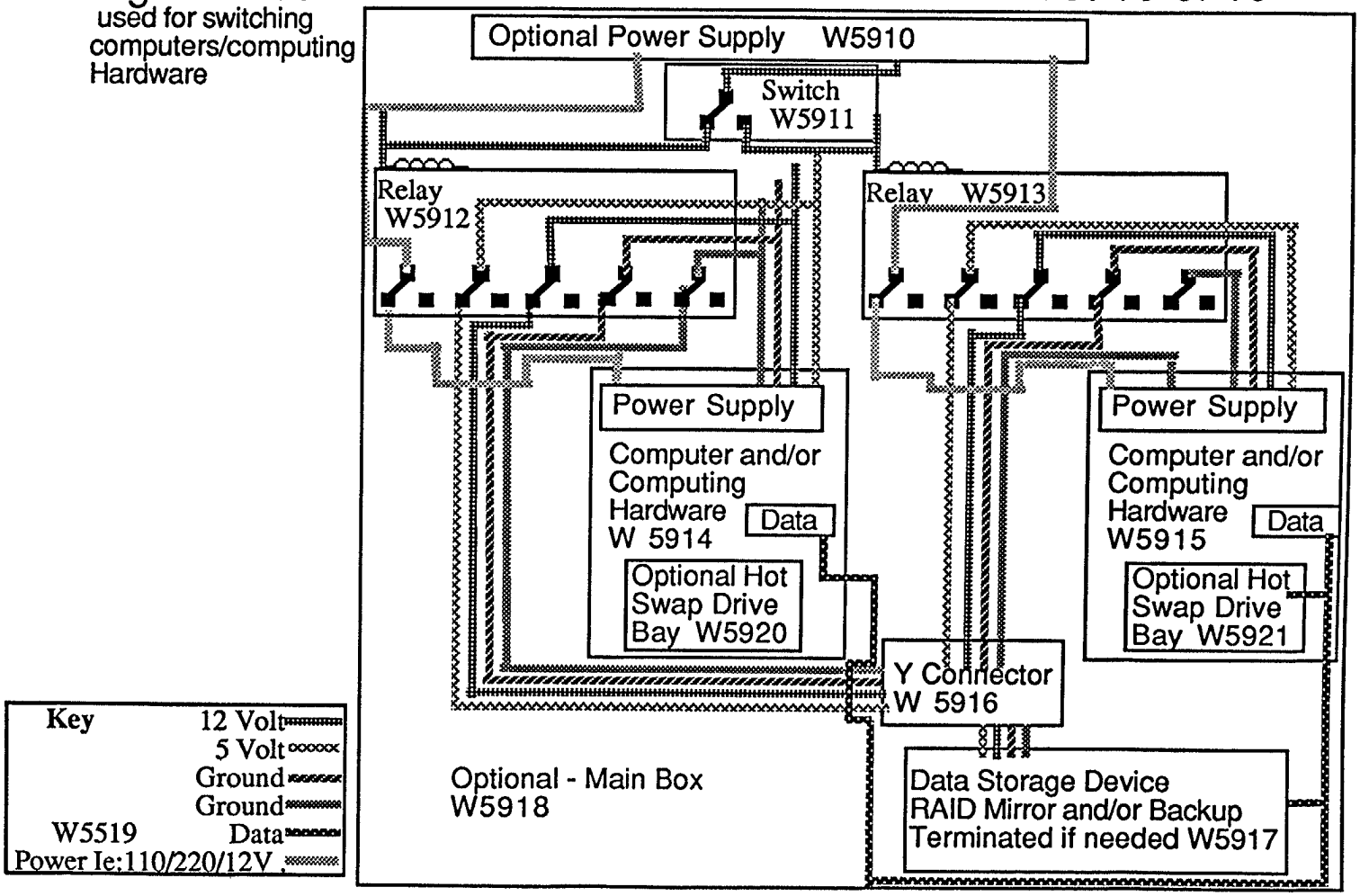
Reset PRAM, CMOS, CUDA, etc. See Diagram R61
W5818

Switch W5817



20T120"989h/00T

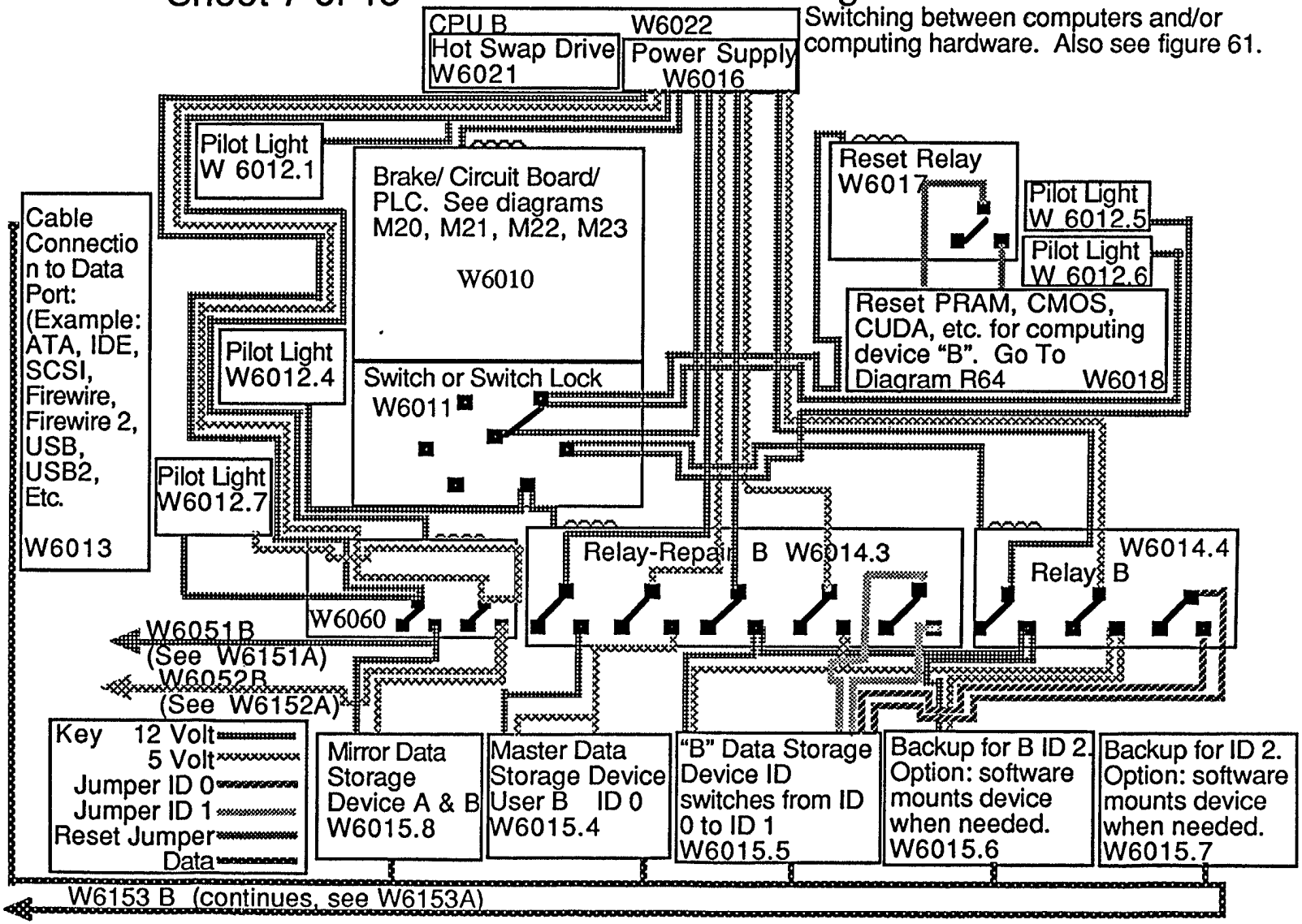
Figure W59
used for switching computers/computing Hardware



20120 989 2007

Figure W60

Switching between computers and/or computing hardware. Also see figure 61.



20T20" 989h20DT

Figure W61

Switching between computers and/or computing hardware.

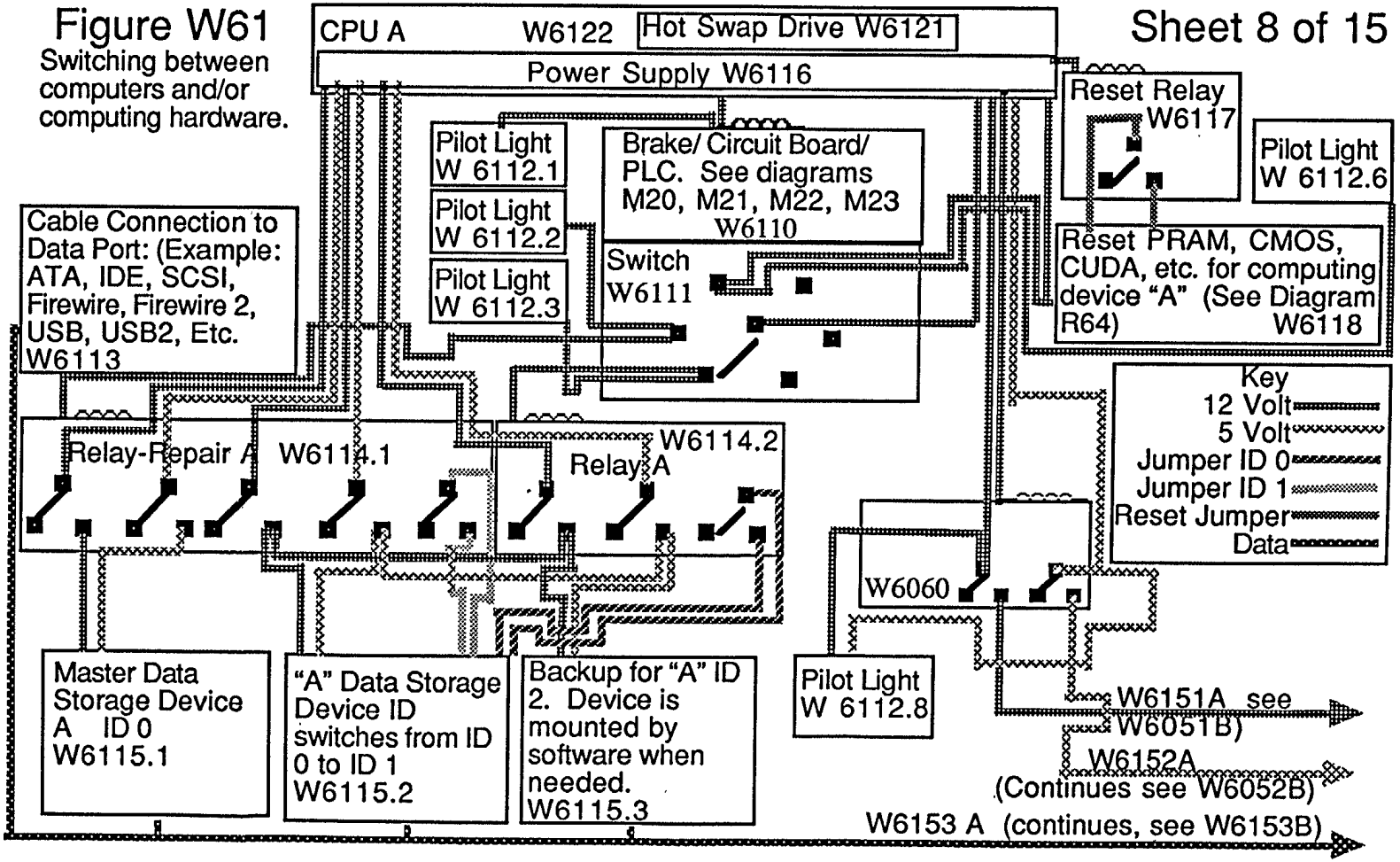
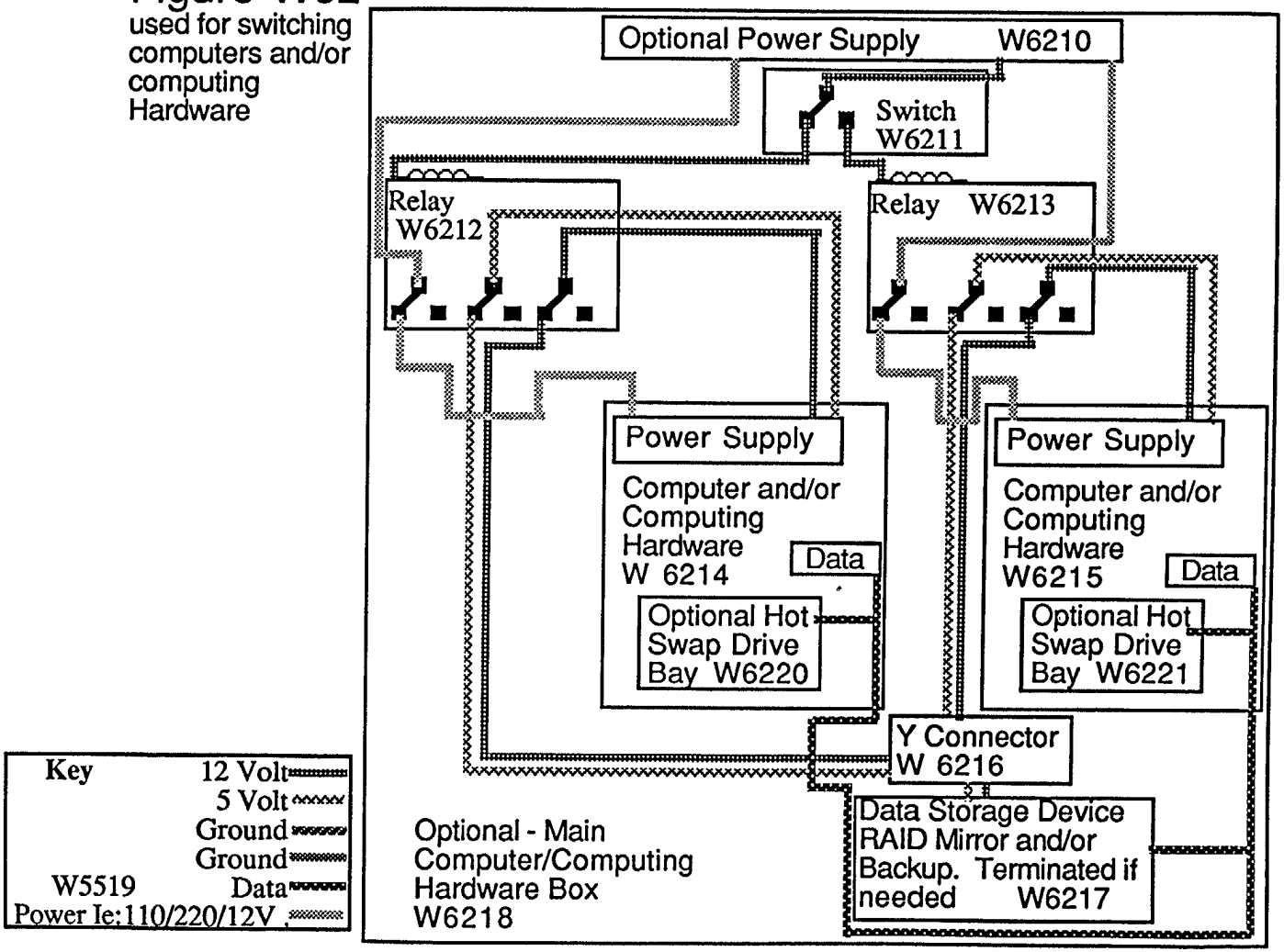


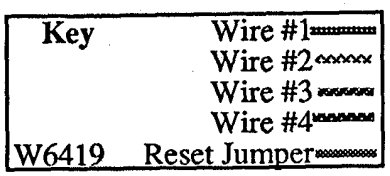
Figure W62
used for switching computers and/or computing Hardware

Sheet 9 of 15

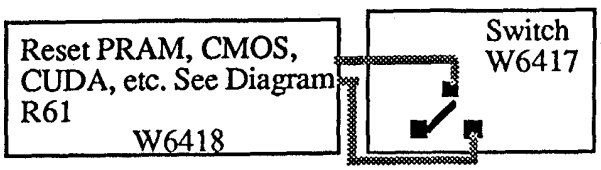


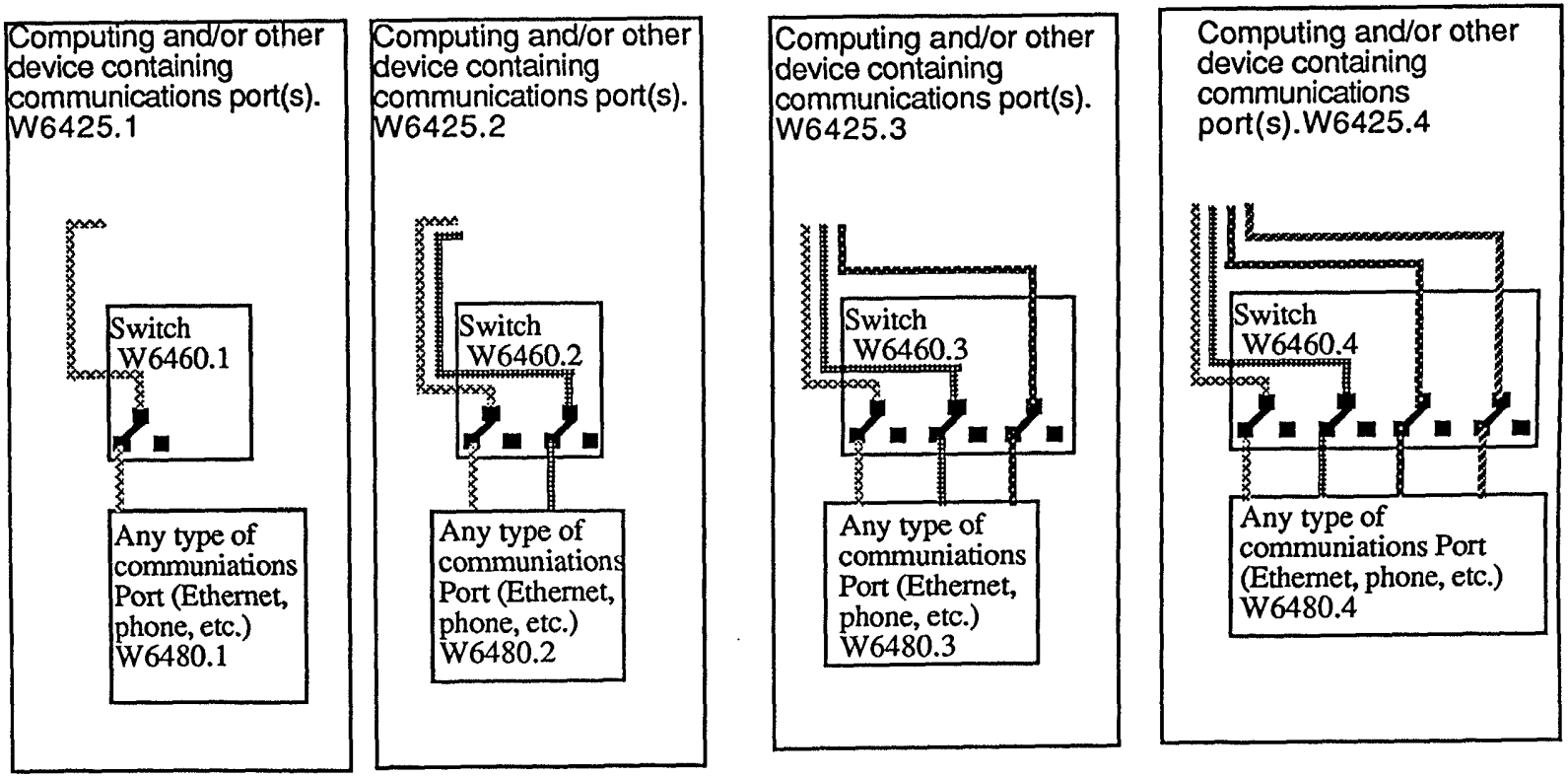
20T120' 989h2007

Figure W64



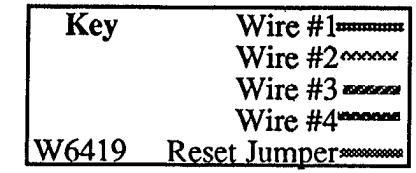
DRAMUS
Figure W64
Switch connection to global computer/communication network, and other networks.

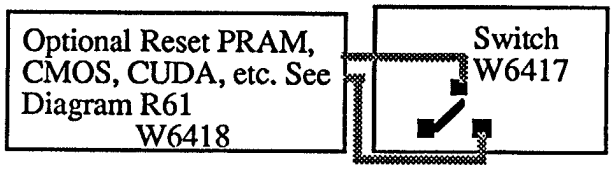


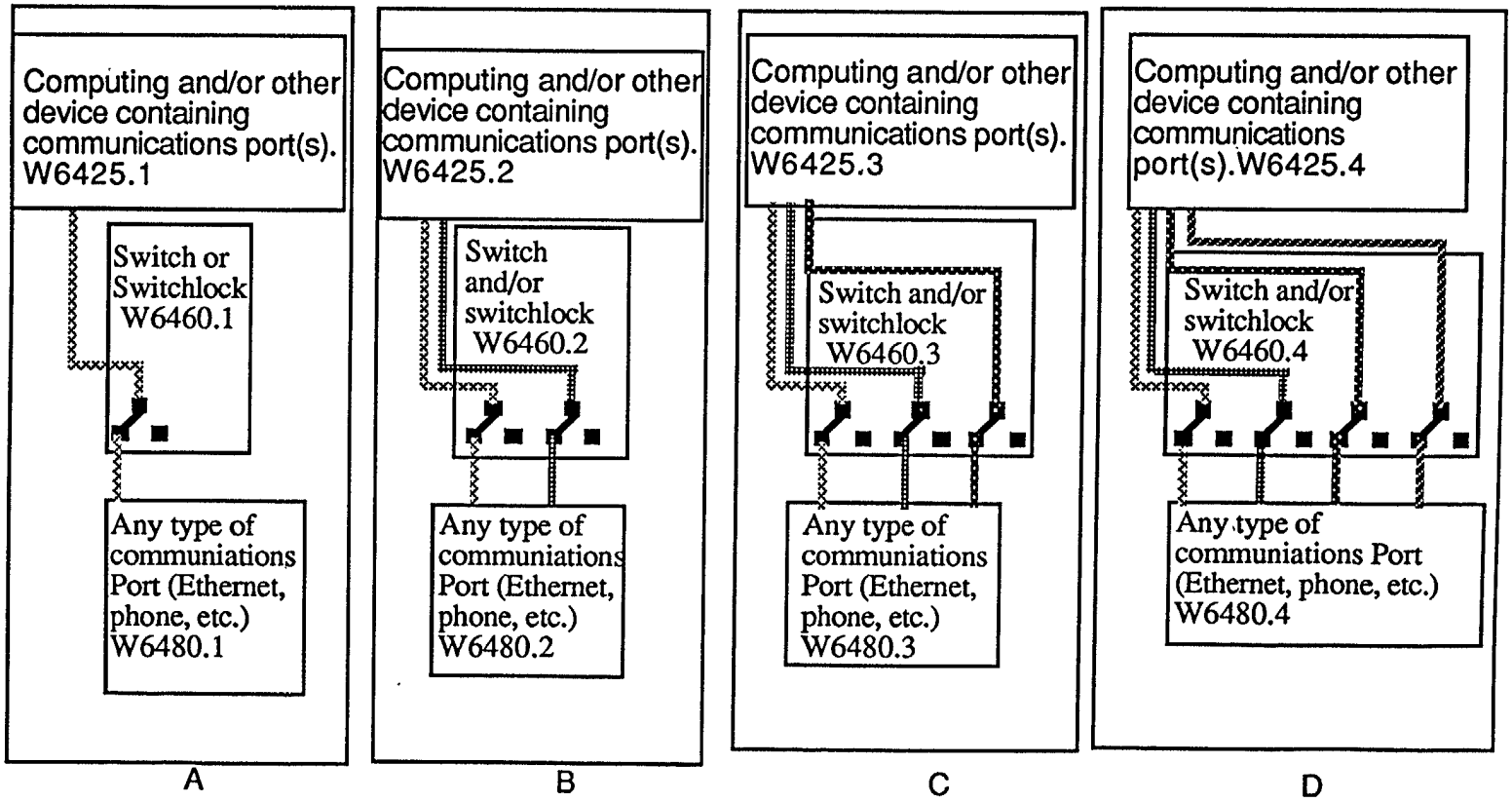


Sheet 1 of 9

Figure W64NL

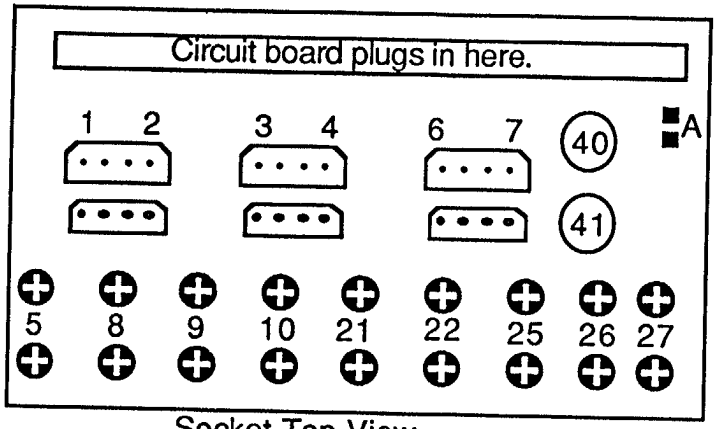




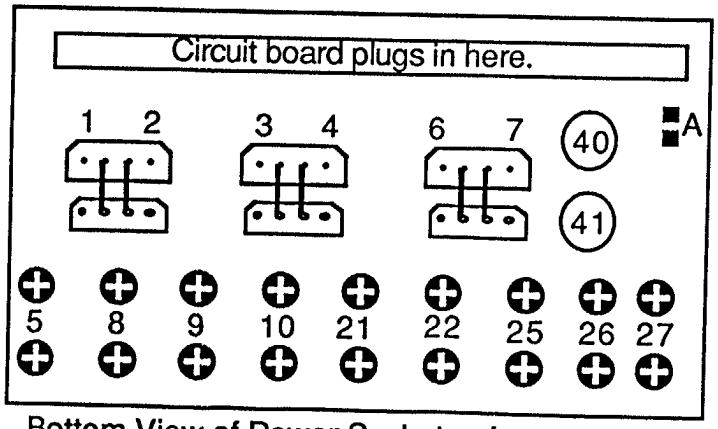


Circuit Board Single-User & Repair

Figure W160

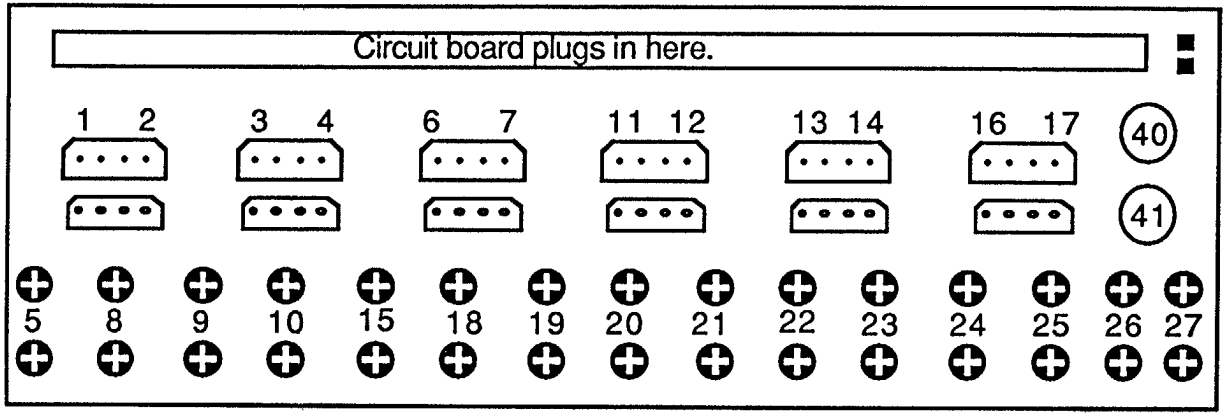


Socket Top View



Bottom View of Power Sockets--Jumpers
on bottom of socket neutral terminals

Socket Top View



Bottom View of Power Sockets--Jumpers on bottom of socket neutral terminals

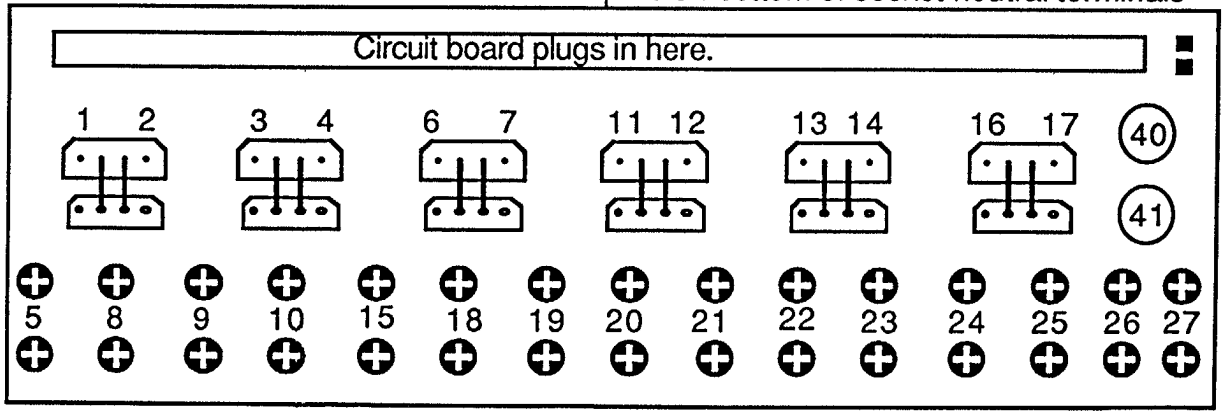
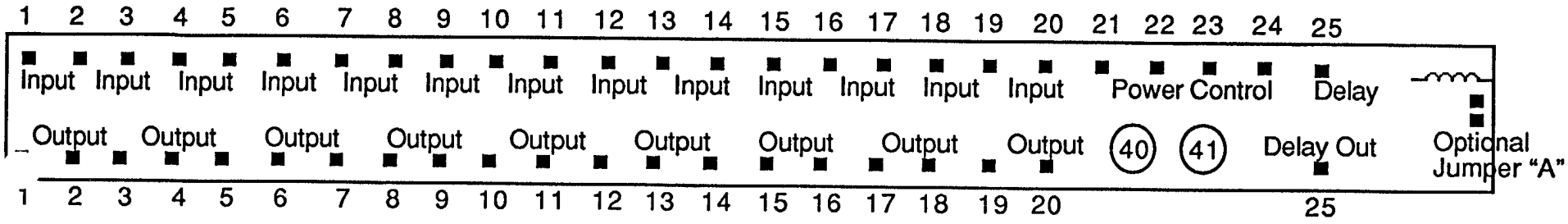


Figure W170 REDUNDANT???



1) circuit 1
2) circuit 2
3) circuit 3
4) circuit 4
5) circuit 5
6) circuit 6
7) circuit 7
8) circuit 8
9) circuit 9
10) circuit 10
11) circuit 11
12) circuit 12
13) circuit 13
14) circuit 14
15) circuit 15
16) circuit 16
17) circuit 17
18) circuit 18
19) circuit 19
20) circuit 20
21) Power Control Indicator #21
22) Power Control Indicator #22
23) Power Control Indicator #23
24) Power Control Indicator #24
25) time delay circuit
40) delay start time for delay circuit
41) stop time for delay circuit

BURPMU may need 4/22/01: Circuit board 7/15/2000

Sociket Top View

Neutrals bypass the Circuit board.... bottom view of neutrals

 Copyright Kenneth Largman and Anthony More 7/15/2000

20T20 98th COT

FIGURE W175

Example of device to Switch and/or lock a network connection "on" or "off"

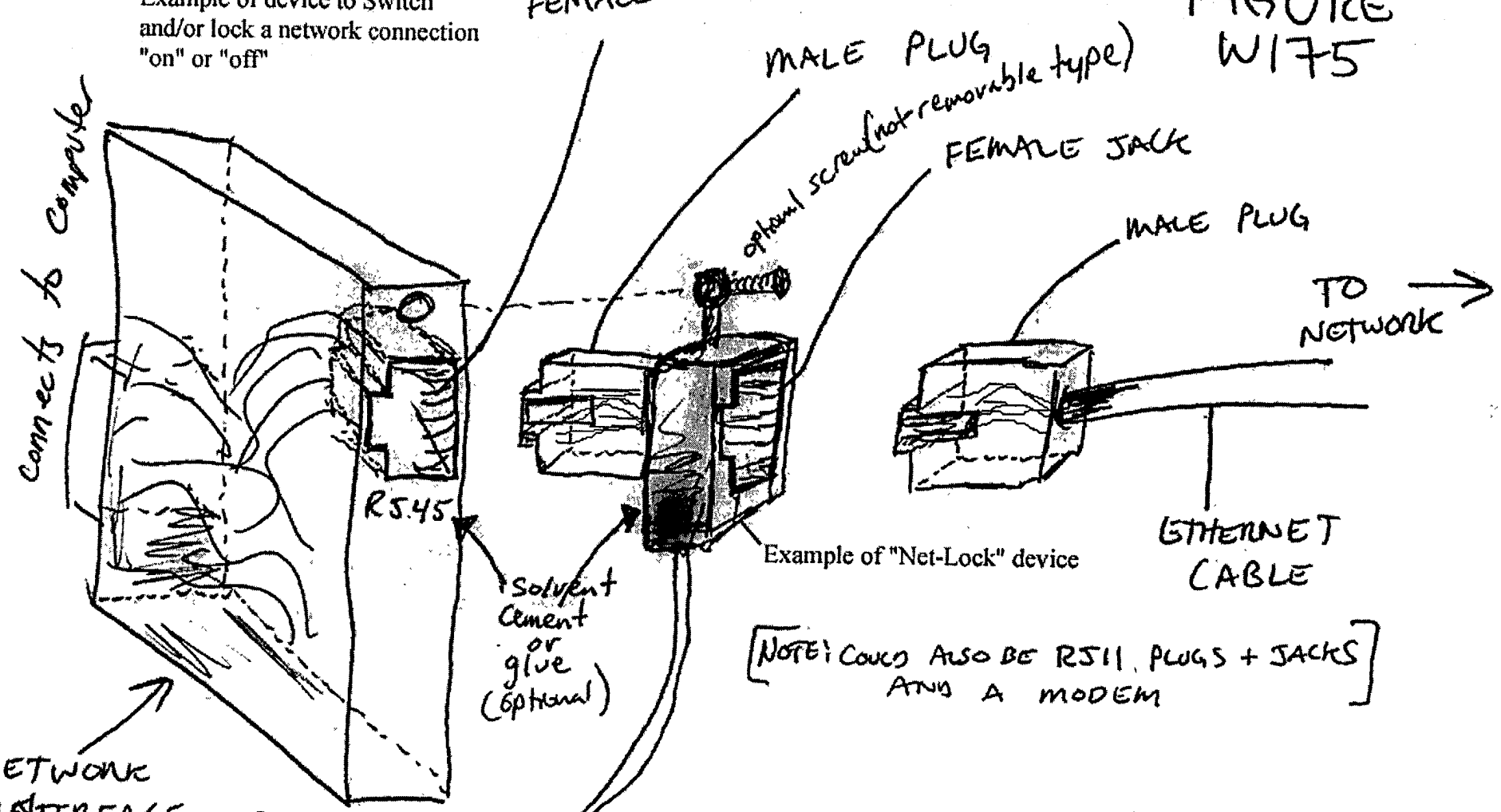


FIGURE W176

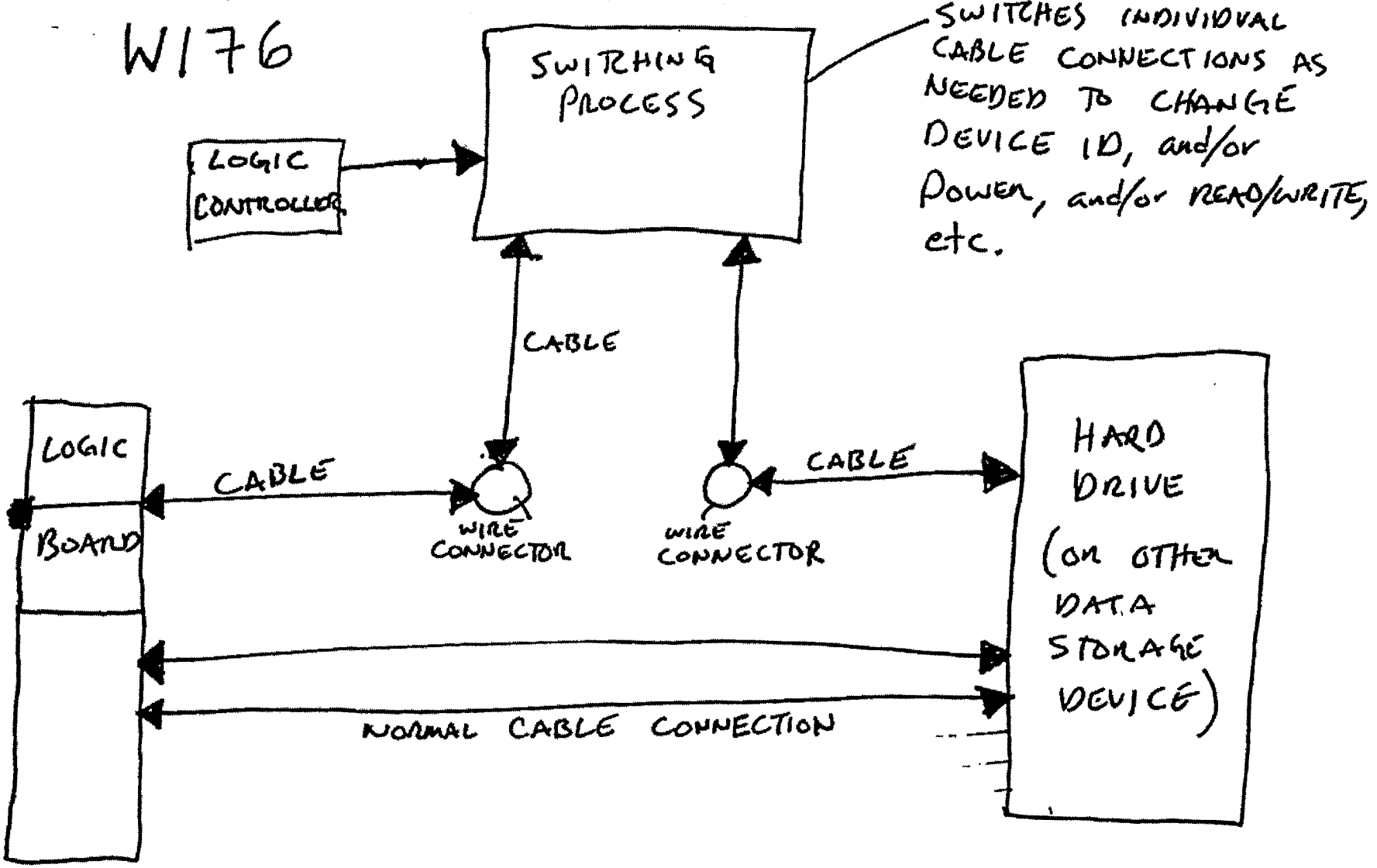

SWITCHING PROCESS
SWITCHES INDIVIDUAL CABLE CONNECTIONS AS NEEDED TO CHANGE DEVICE ID, and/or POWER, and/or READ/WRITE, etc.
LOGIC CONTROLLER
CABLE
LOGIC BOARD
CABLE
WIRE CONNECTOR
WIRE CONNECTOR
CABLE
HARD DRIVE (OR OTHER DATA STORAGE DEVICE)
NORMAL CABLE CONNECTION

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Figure W 177

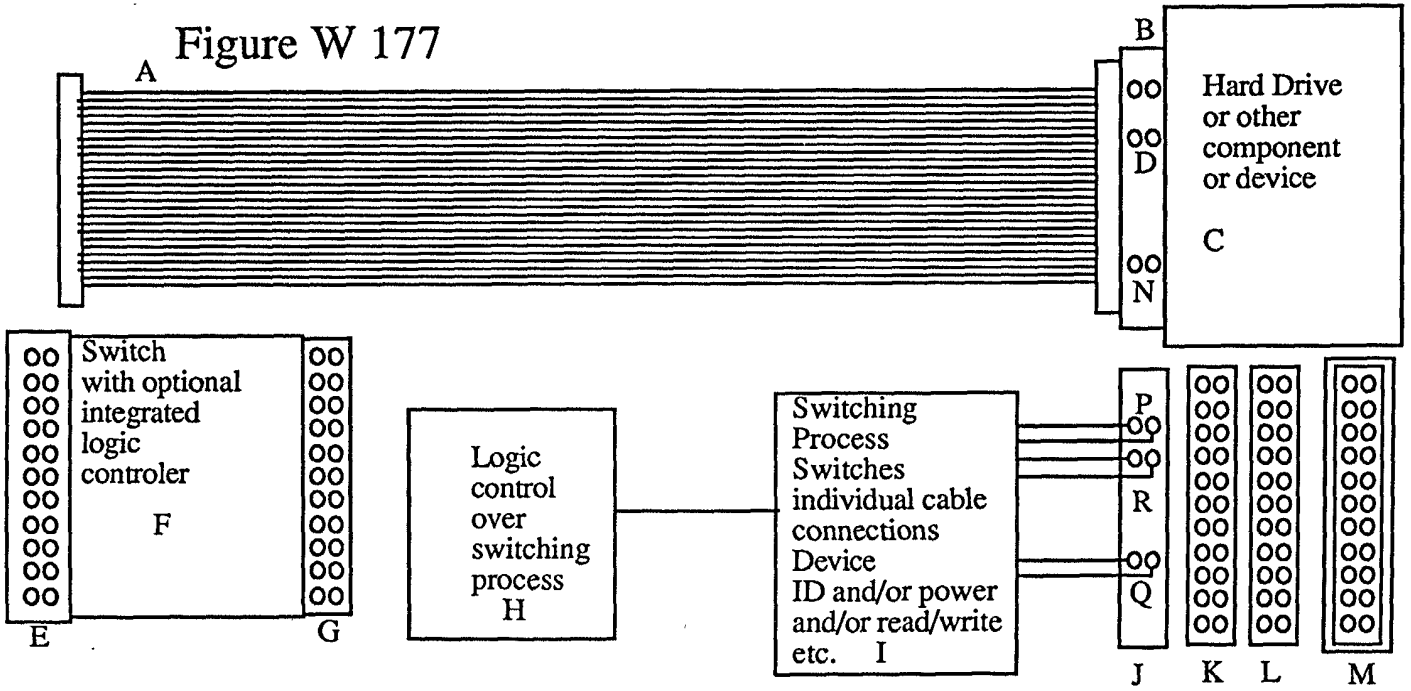

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Figure W 178

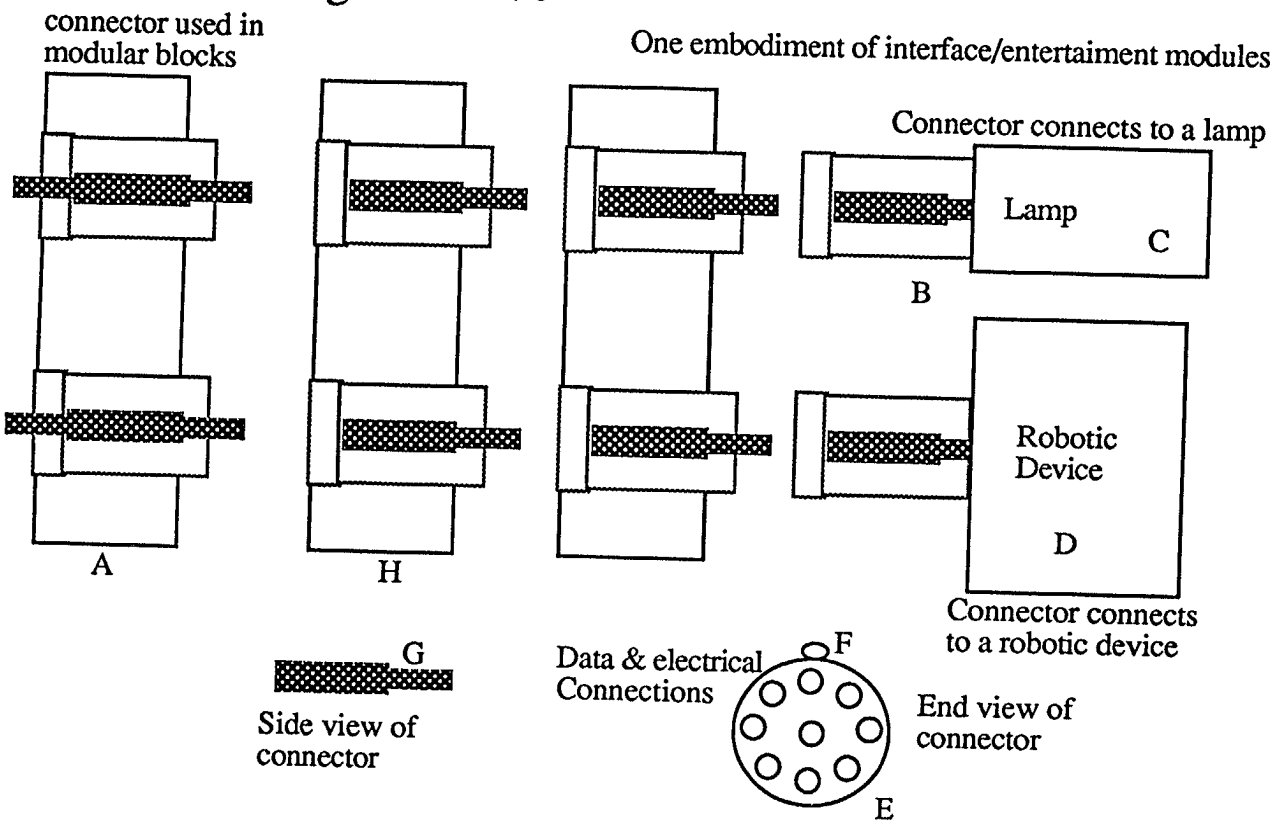

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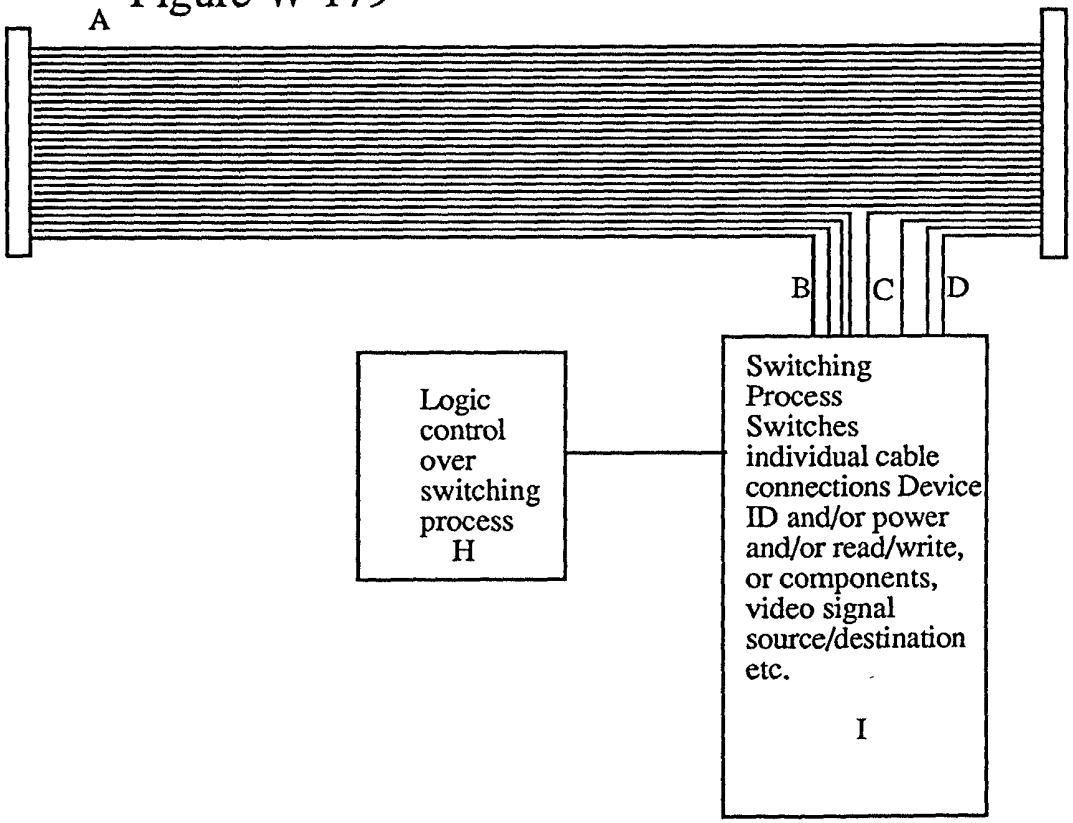
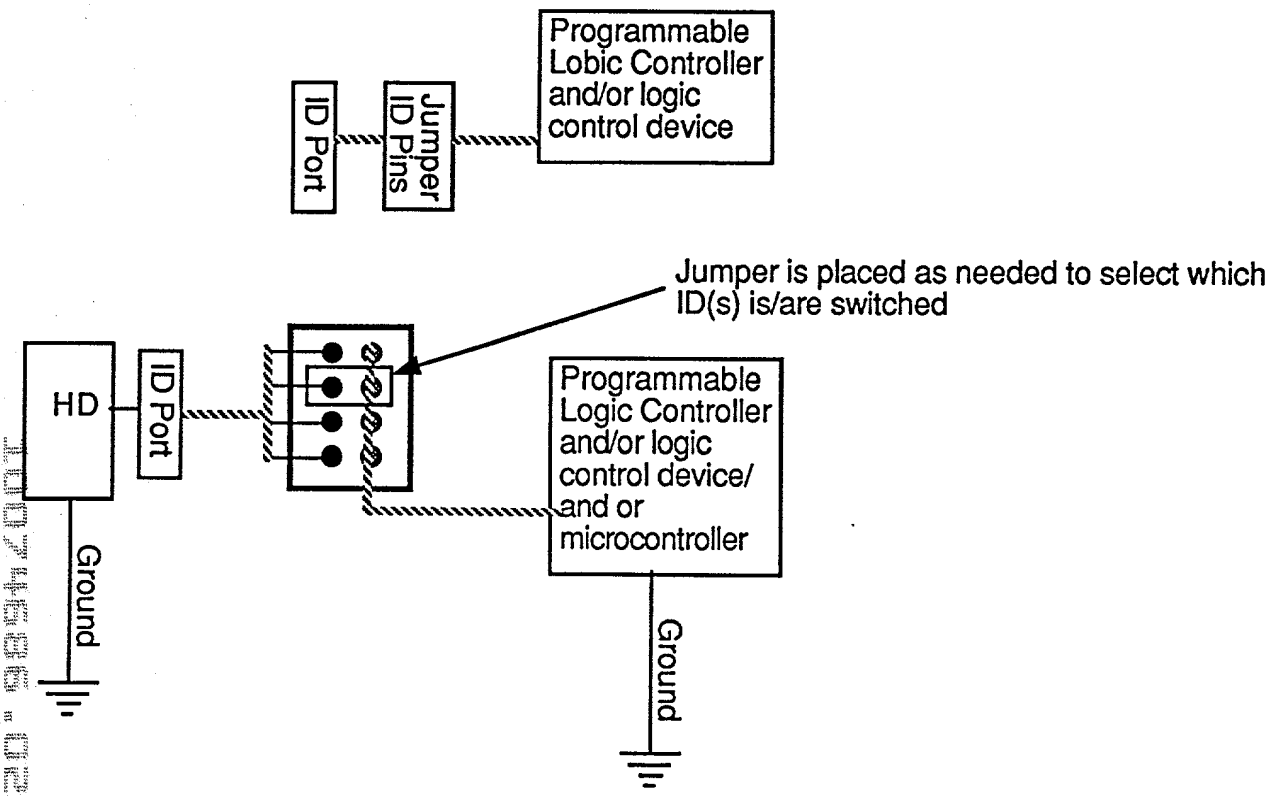
Figure W 179

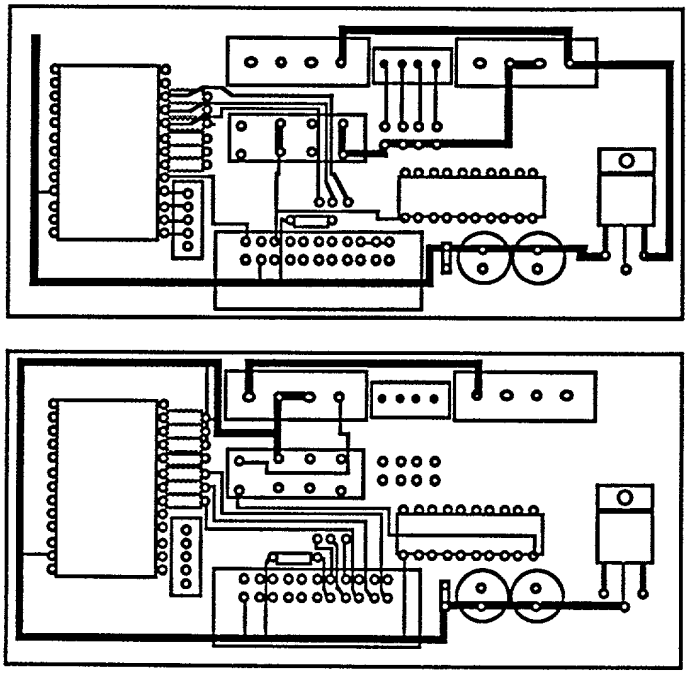


WJ1



Pink are common on the circuit board. they connect to 1 IO pin of the microcontoller
Black connect to A0 A1 A2 A3 on hard drive.

WJ2



WJ3

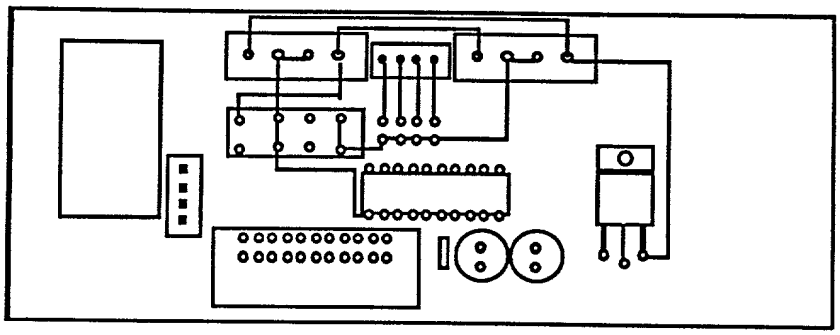
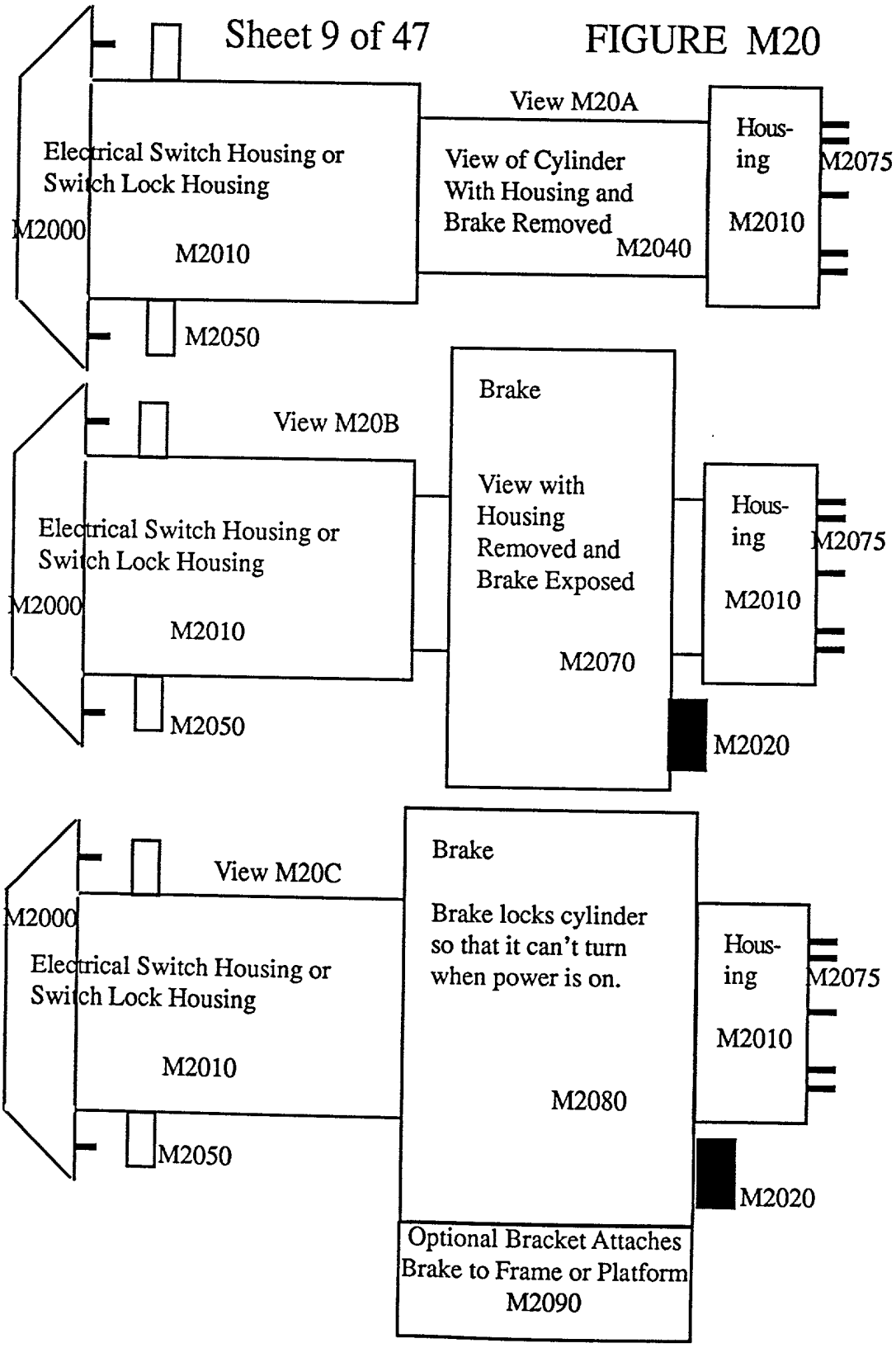
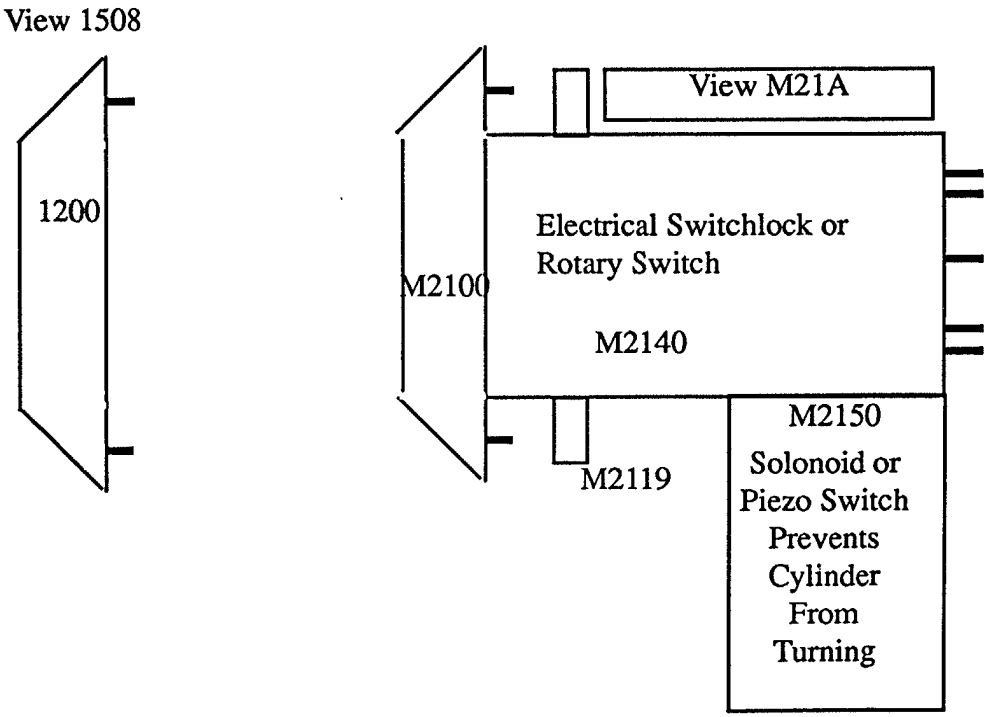


FIGURE M20


View M20A
Electrical Switch Housing or Switch Lock Housing
M2000
M2010
M2050
View of Cylinder With Housing and Brake Removed
M2040
Housing
M2010
M2075
View M20B
Electrical Switch Housing or Switch Lock Housing
M2000
M2010
M2050
Brake
View with Housing Removed and Brake Exposed
M2070
M2020
Housing
M2010
M2075
View M20C
M2000
Electrical Switch Housing or Switch Lock Housing
M2010
M2050
Brake
Brake locks cylinder so that it can't turn when power is on.
M2080
M2020
Housing
M2010
M2075
Optional Bracket Attaches Brake to Frame or Platform
M2090

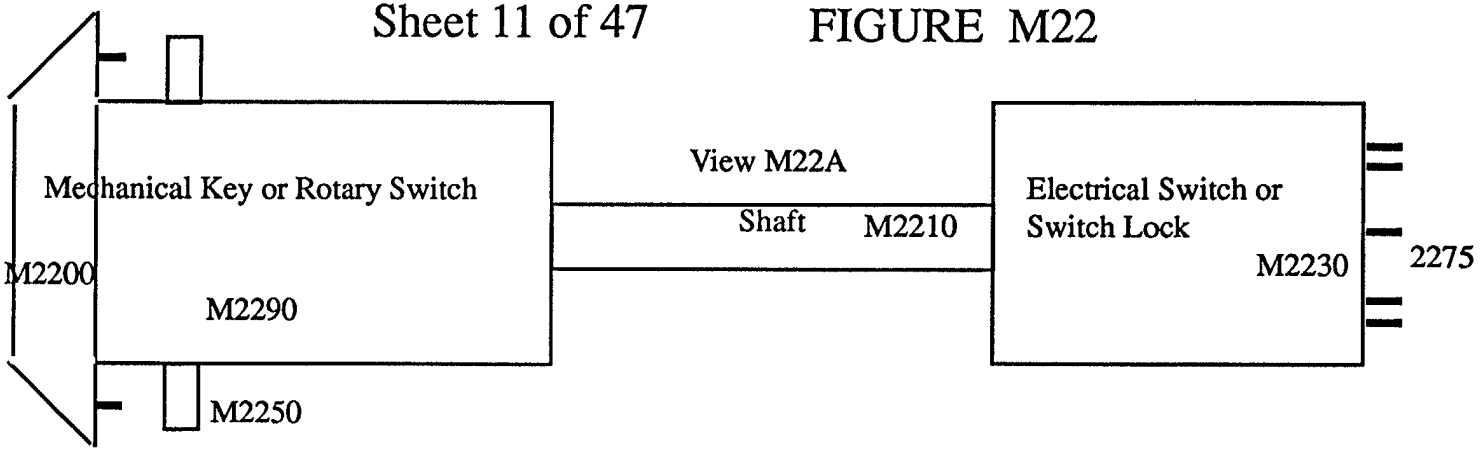
20120-9894/2007

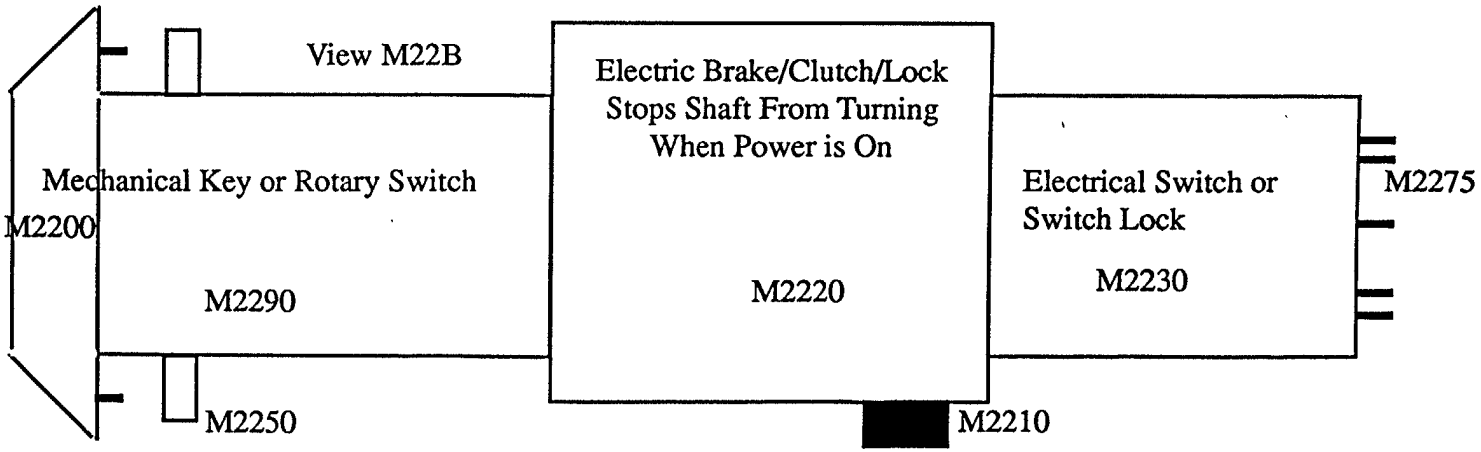
FIGURE M21



Interchangeable Page 102

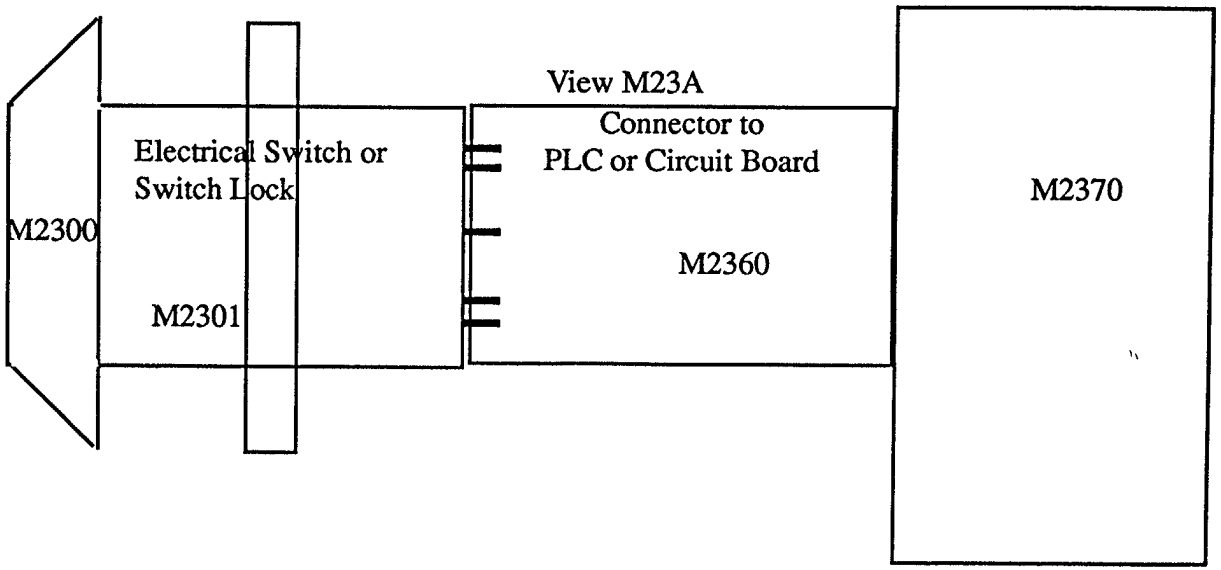
FIGURE M22


Mechanical Key or Rotary Switch
M2200
M2290
M2250
View M22A
Shaft
M2210
Electrical Switch or
Switch Lock
M2230
2275


View M22B
Mechanical Key or Rotary Switch
M2200
M2290
M2250
Electric Brake/Clutch/Lock
Stops Shaft From Turning
When Power is On
M2220
M2210
Electrical Switch or
Switch Lock
M2230
M2275

20T20" 989h2001

FIGURE M23



10d902h59a3a3d4a02

FIGURE M24

Sheet 9 of 9

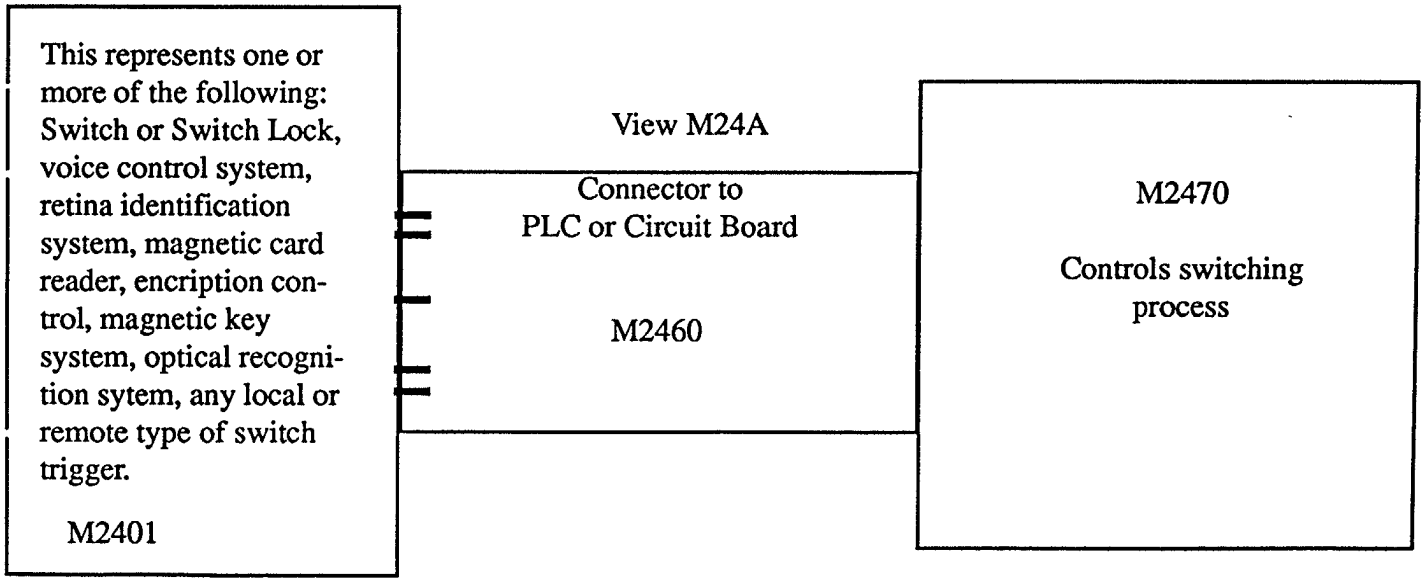
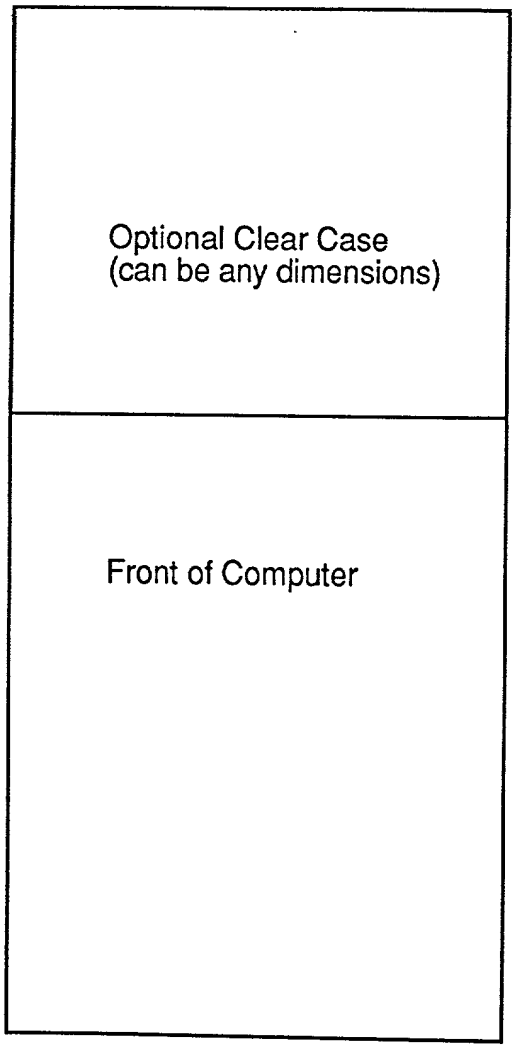


Figure E1



20120 9694/001

Figure E2

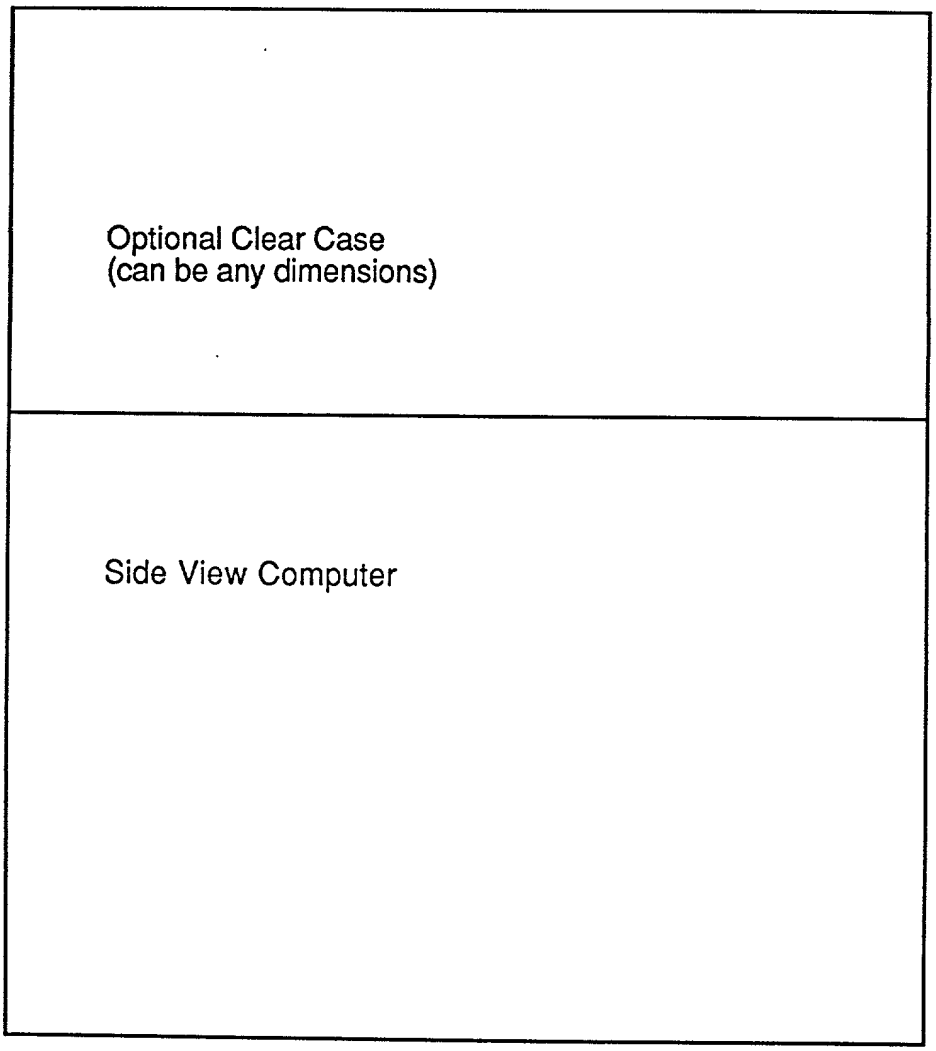
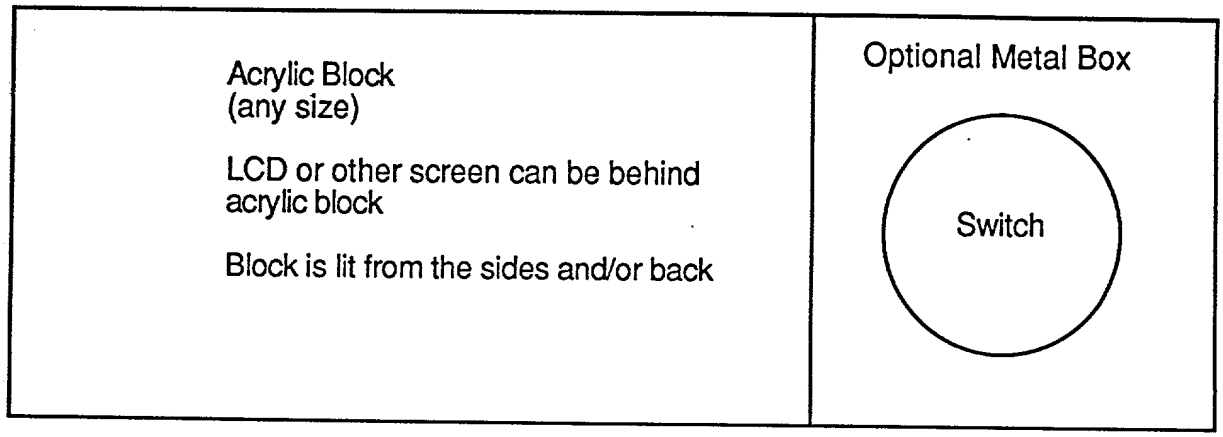
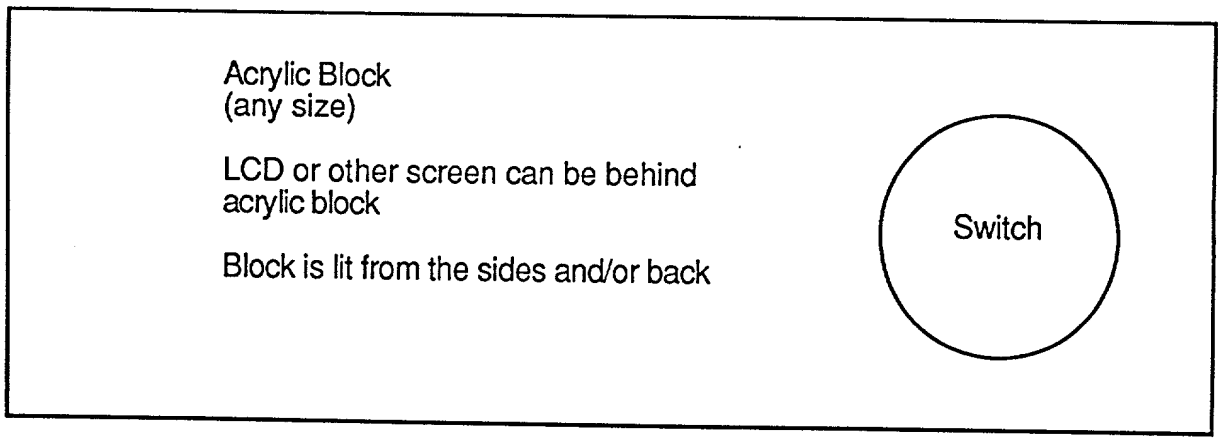

Optional Clear Case
(can be any dimensions)
Side View Computer

Figure E3





Application Ser. No. 09/464,607

Figure E4

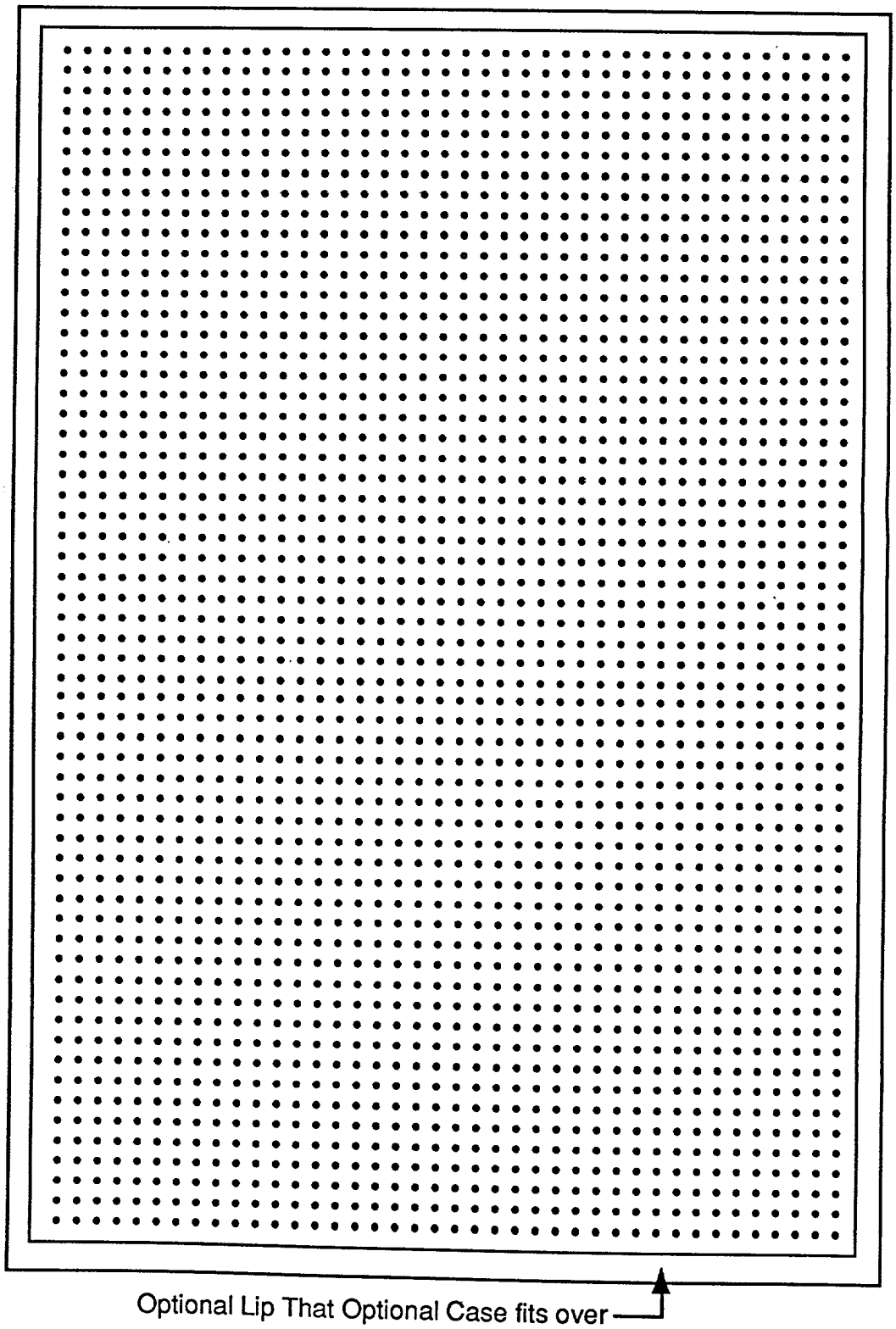


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Figure E5

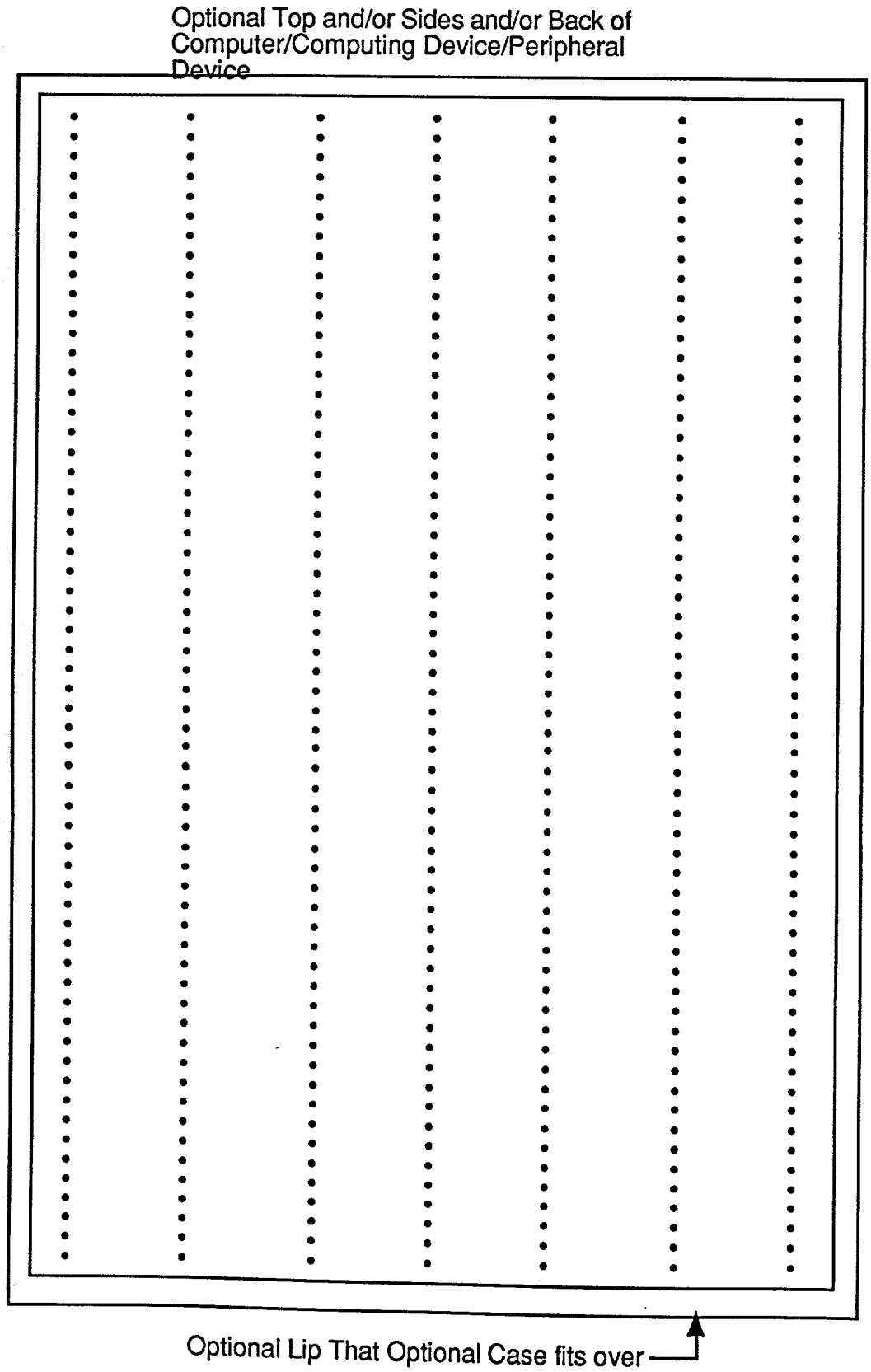

Optional Top and/or Sides and/or Back of Computer/Computing Device/Peripheral Device
Optional Lip That Optional Case fits over

Figure E6

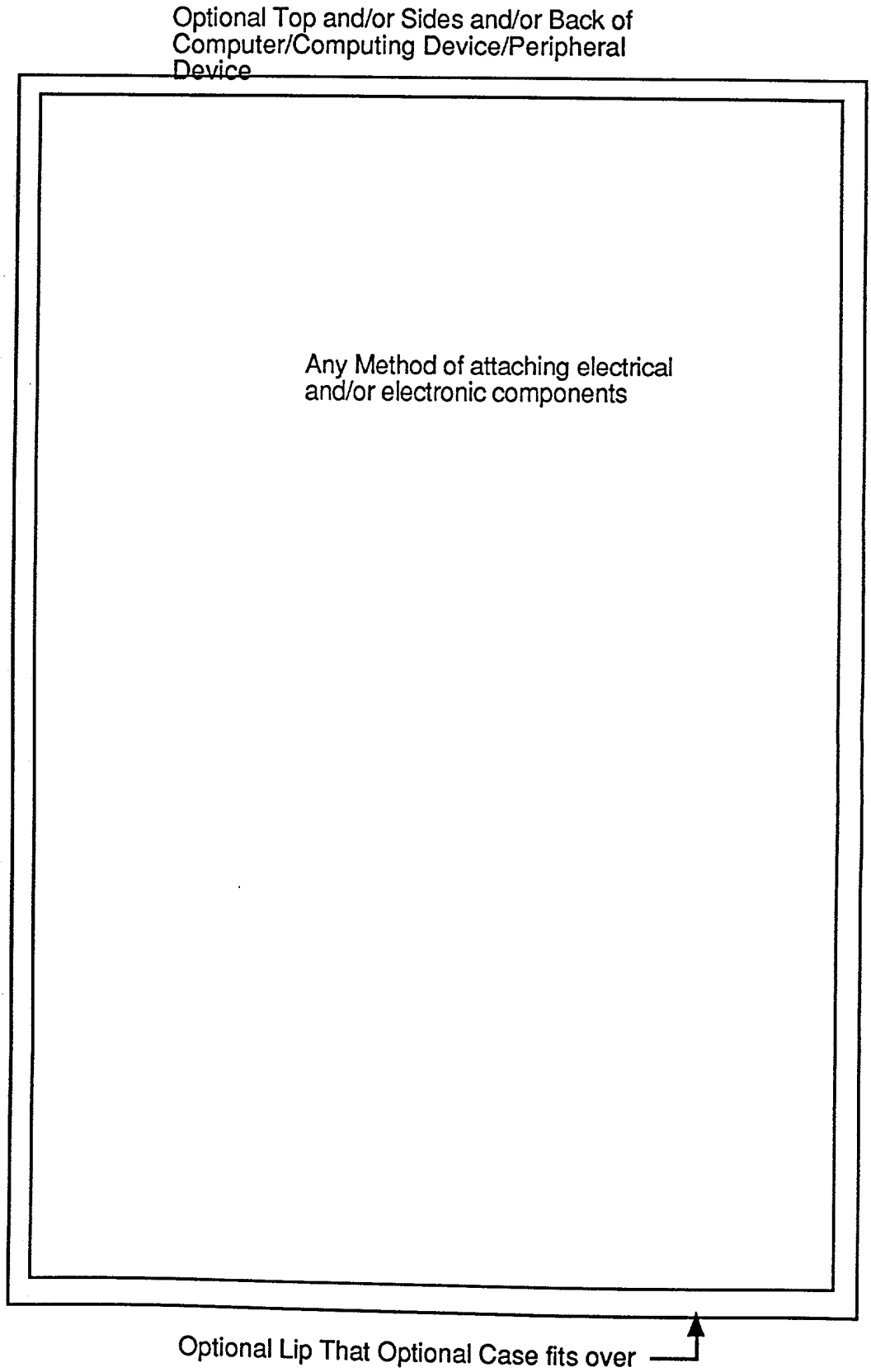
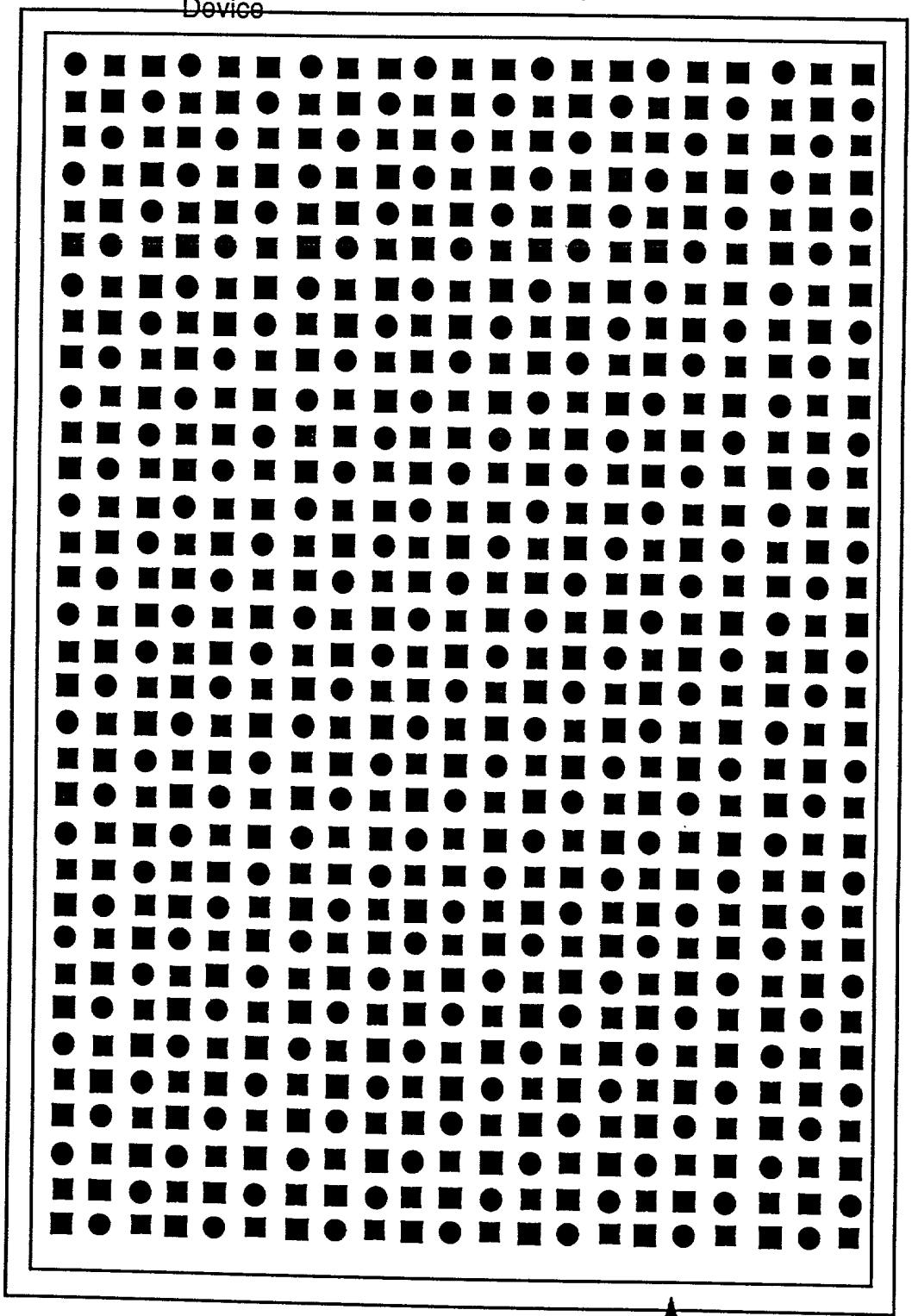

Optional Top and/or Sides and/or Back of Computer/Computing Device/Peripheral Device
Any Method of attaching electrical and/or electronic components
Optional Lip That Optional Case fits over

Figure E7

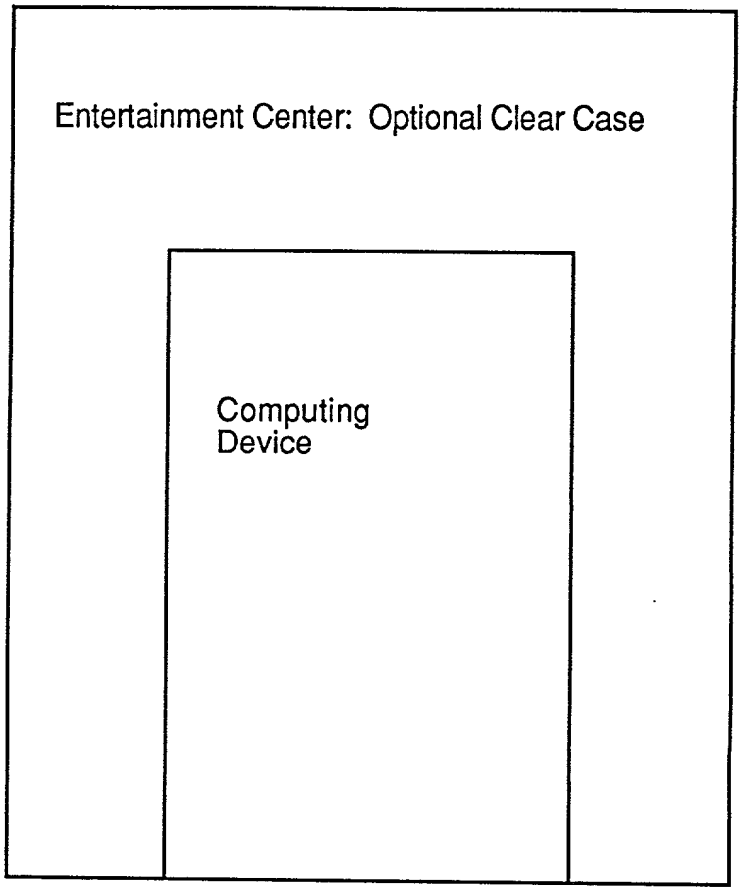
Optional Top and/or Sides and/or Back of Computer/Computing Device/Peripheral Device



Optional Lip That Optional Case fits over

USPTO-6994-2007

Figure E8


Entertainment Center: Optional Clear Case
Computing
Device

Patent Application Publication Aug. 25, 2005 Sheet 9 of 25 US 2005/0185380 A1

Figure E9

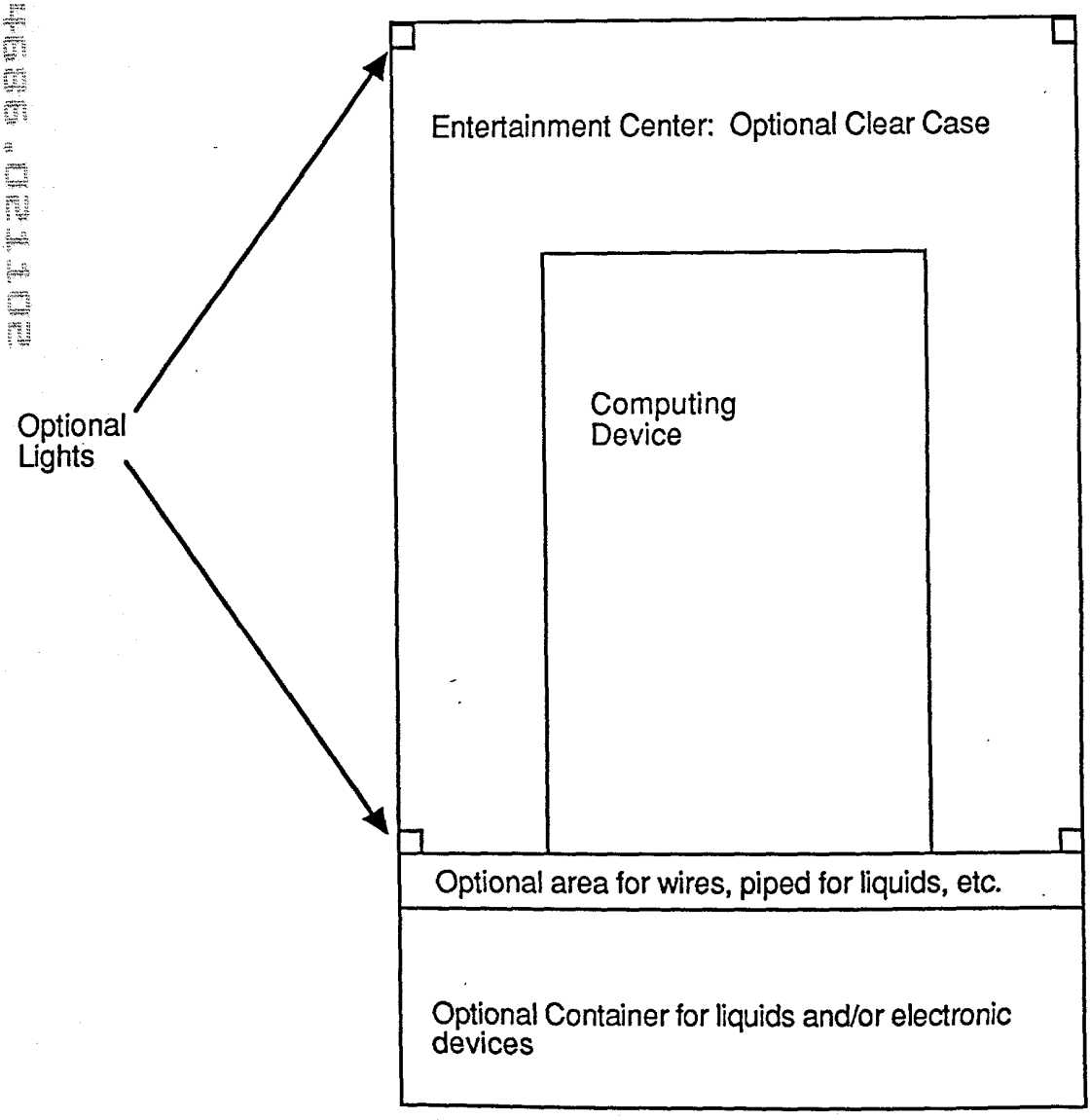
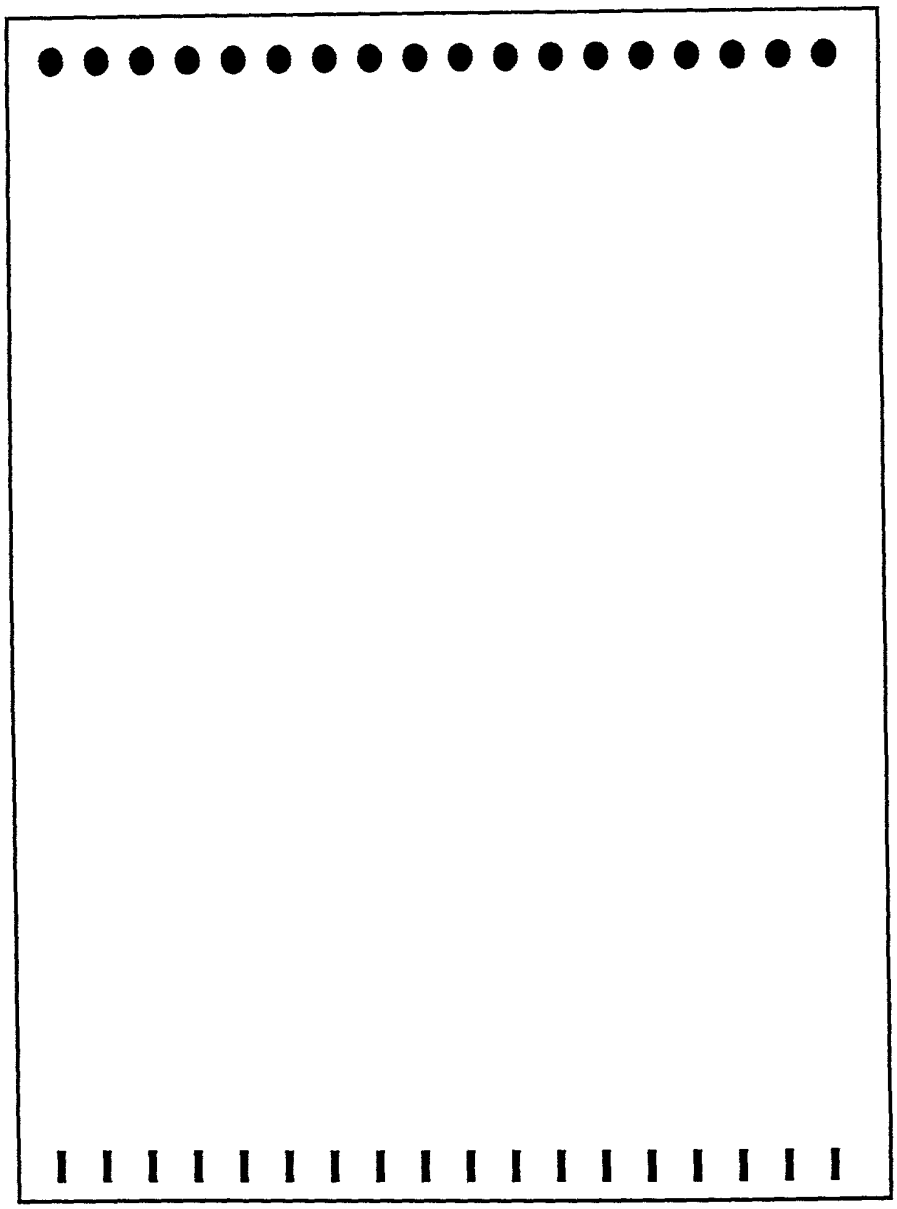


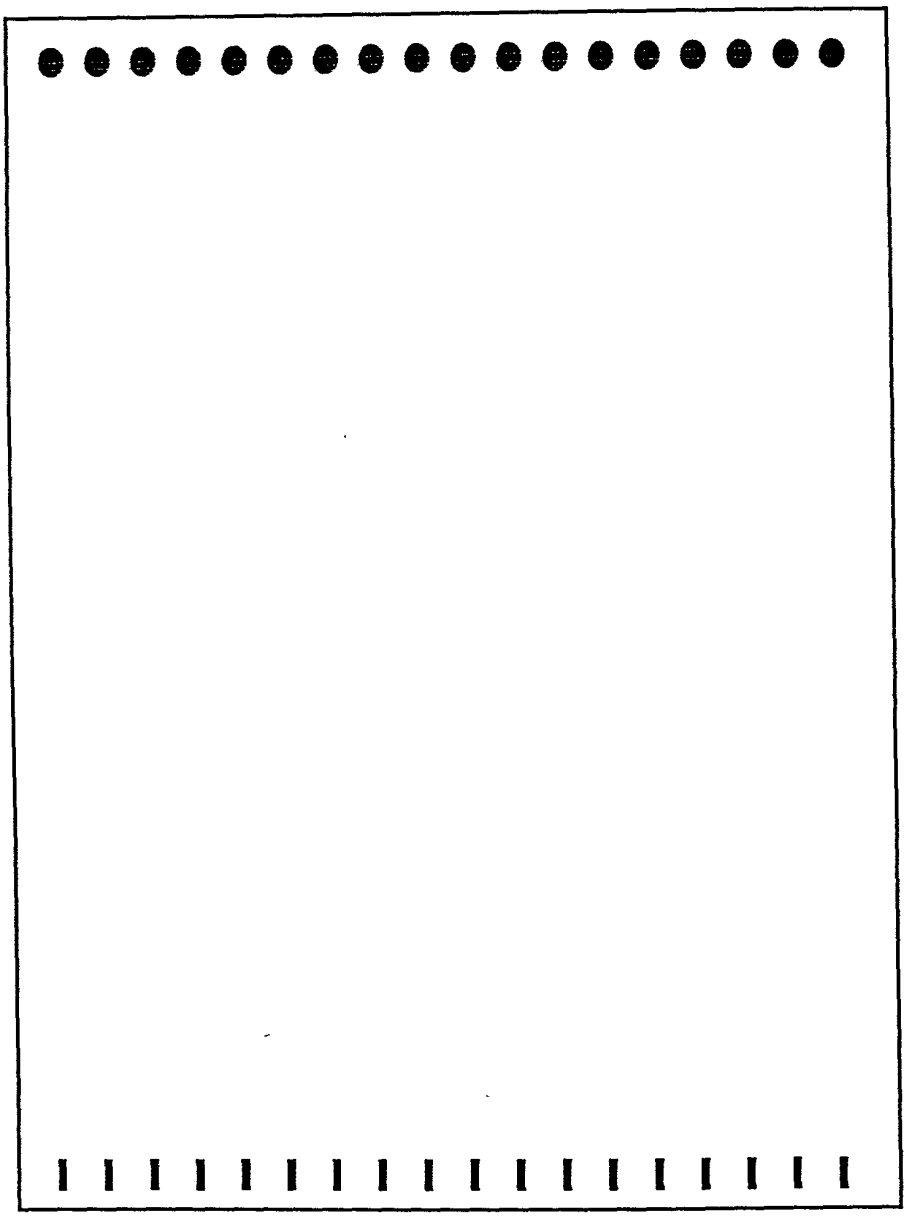
Figure E10



Optional Top and/or sides. Circuit board and/or device connector board plugs into power sources on top of computing device.

Patent Application Publication

Figure E11

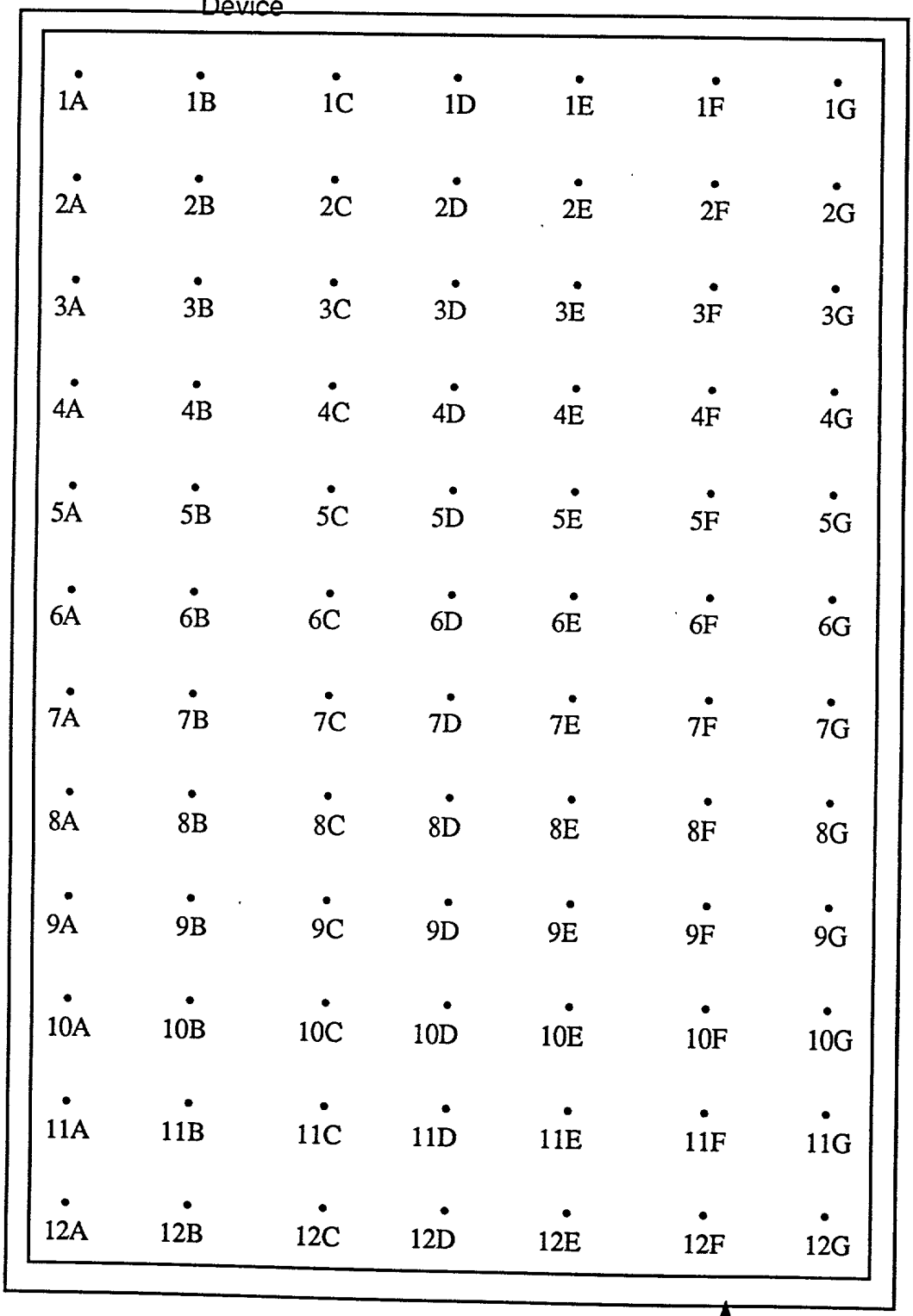


Optional Example circuit board (bottom View) and/or device connector board plugs. It plugs into power sources on top and/or sides of computing device. This is a functional design that only shows connections to power sources from computing device.

1007456 05/24/02

Figure E12

Optional Top and/or Sides and/or Back of Computer/Computing Device/Peripheral Device

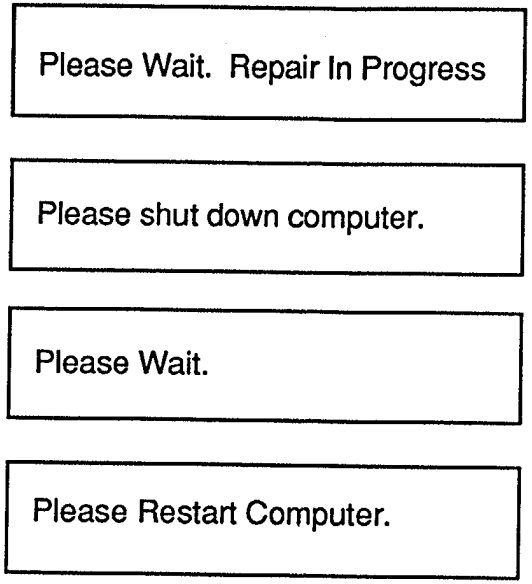


Optional Lip That Optional Case fits over

Numbers, letters, and/or symbols match top and bottom of board. Wires hook wherever user wants to put them. Software controls circuits.

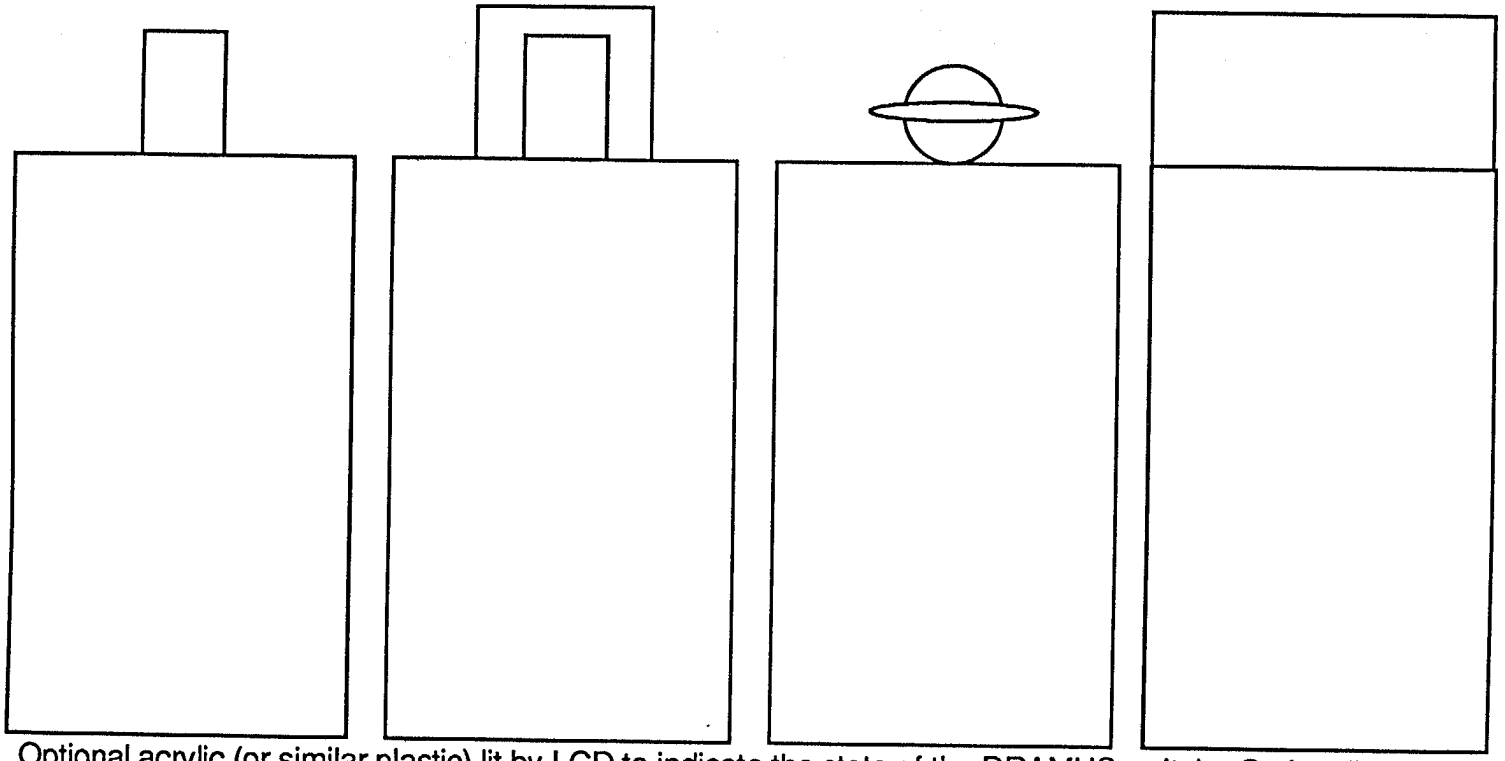
Serial No. 09/694,705 Filed 10/23/2000

Figure E 14 Examples of optional LCD screen dialog.



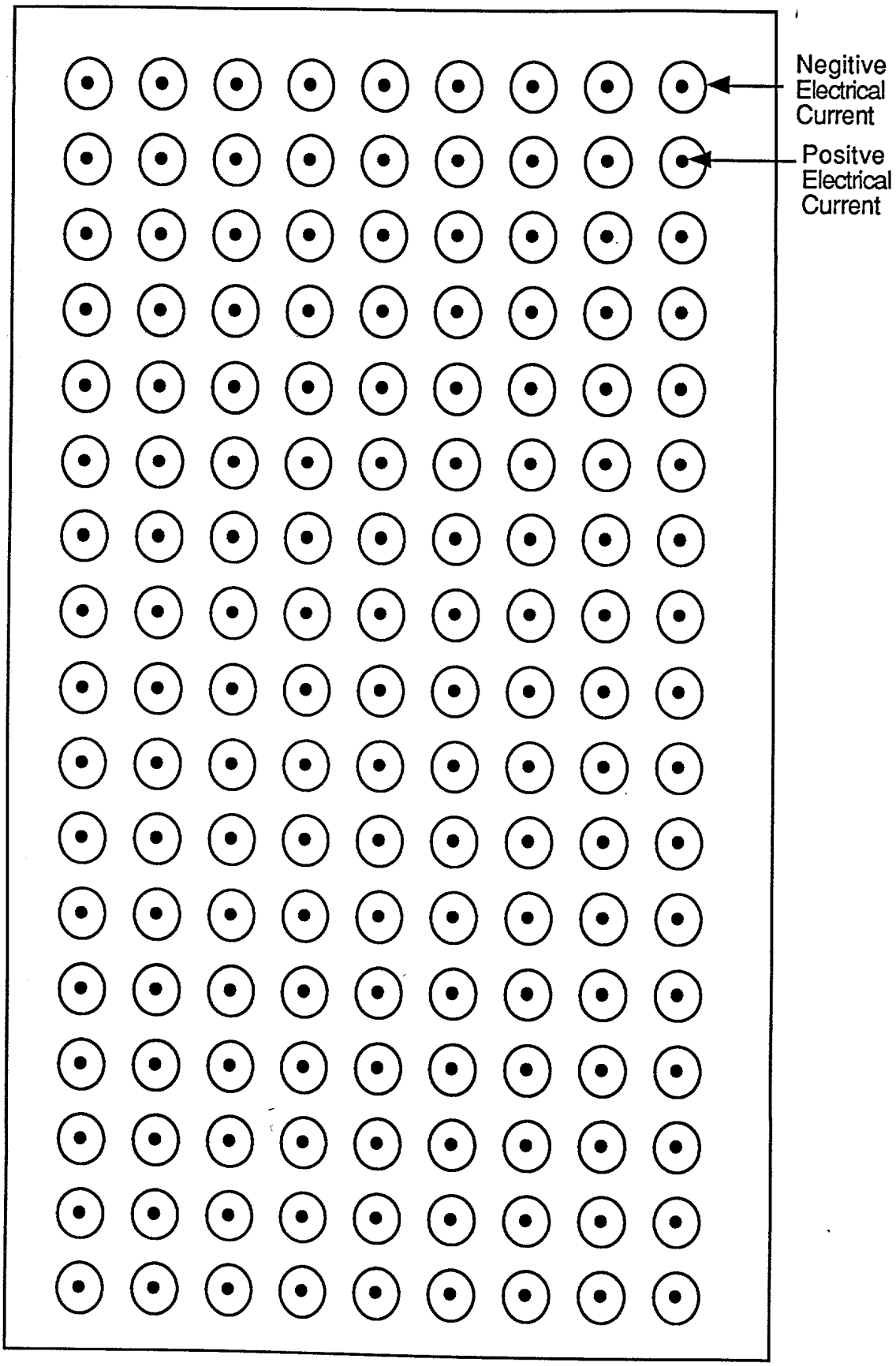
In addition to using an LCD screen, or in Lieu of using an LCD screen, dialog can be written directly to monitor, and/or communicated by other means of communication such as speech.

Figure E80 Optional interactive display and entertainment compone



Optional acrylic (or similar plastic) lit by LCD to indicate the state of the DRAMUS switch. Optionally it can also be used as a decoration triggered by sound, motion, etc. Various colored lights are used to change colors in acrylic. Other art pieces can also be put in these "entertainment" boxes, such as lava lights, plasma lamps, and various art projects.

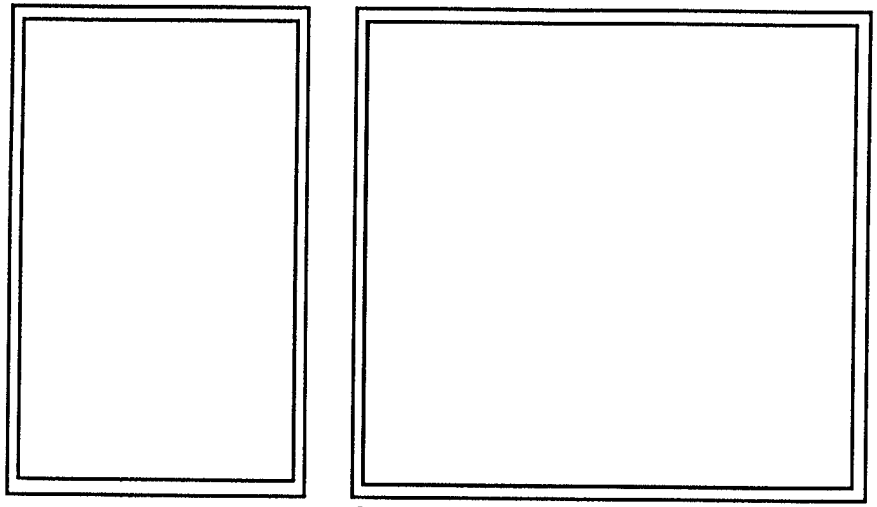
Figure E81



20170223 "9994647001

20t20* 969k/00C

Figure E82



Optional Colored Transparent Acrylic Case Lit by LCD or other light source. A layer of white acrylic or similar material can be under the outer layer for the purpose of diffusing the light. Optionally, case can be clear and change color when computer functions change when different groups of colored LCDs go on depending on switching functions taking place, or sounds, motion or other triggers.

WO97/16838 PCT/US96/17632

Figure E83

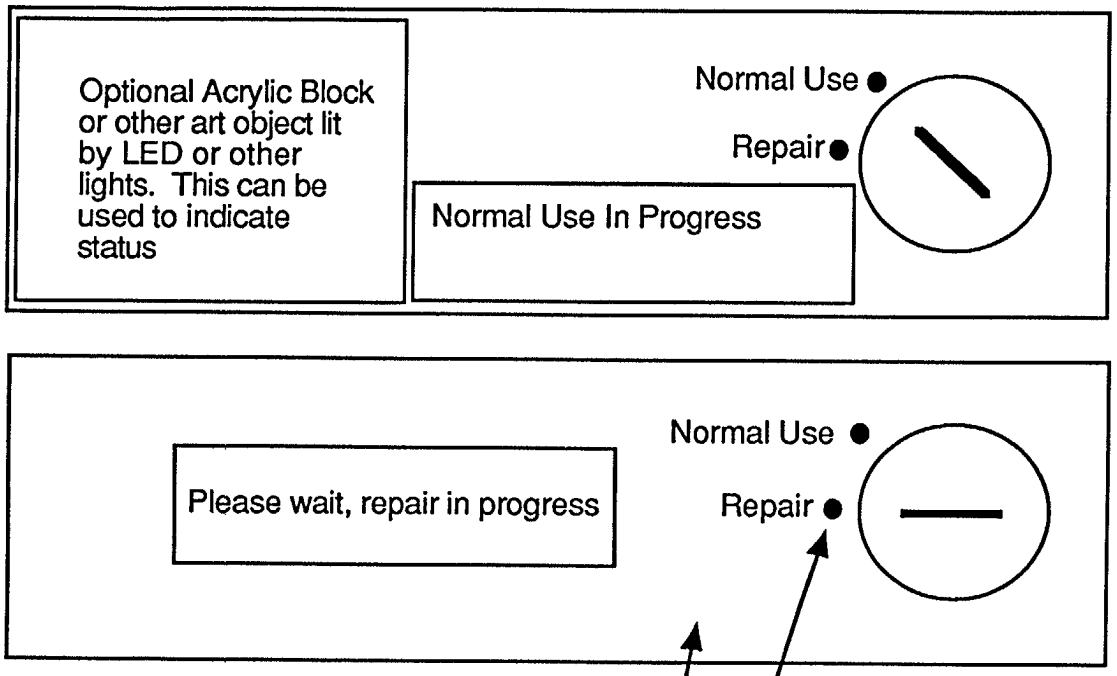

Optional Acrylic Block or other art object lit by LED or other lights. This can be used to indicate status
Normal Use
Repair
Normal Use In Progress
Please wait, repair in progress
Normal Use
Repair
Optional acrylic lit by LED or other light source.
Optional LED activity lights

Figure L 70

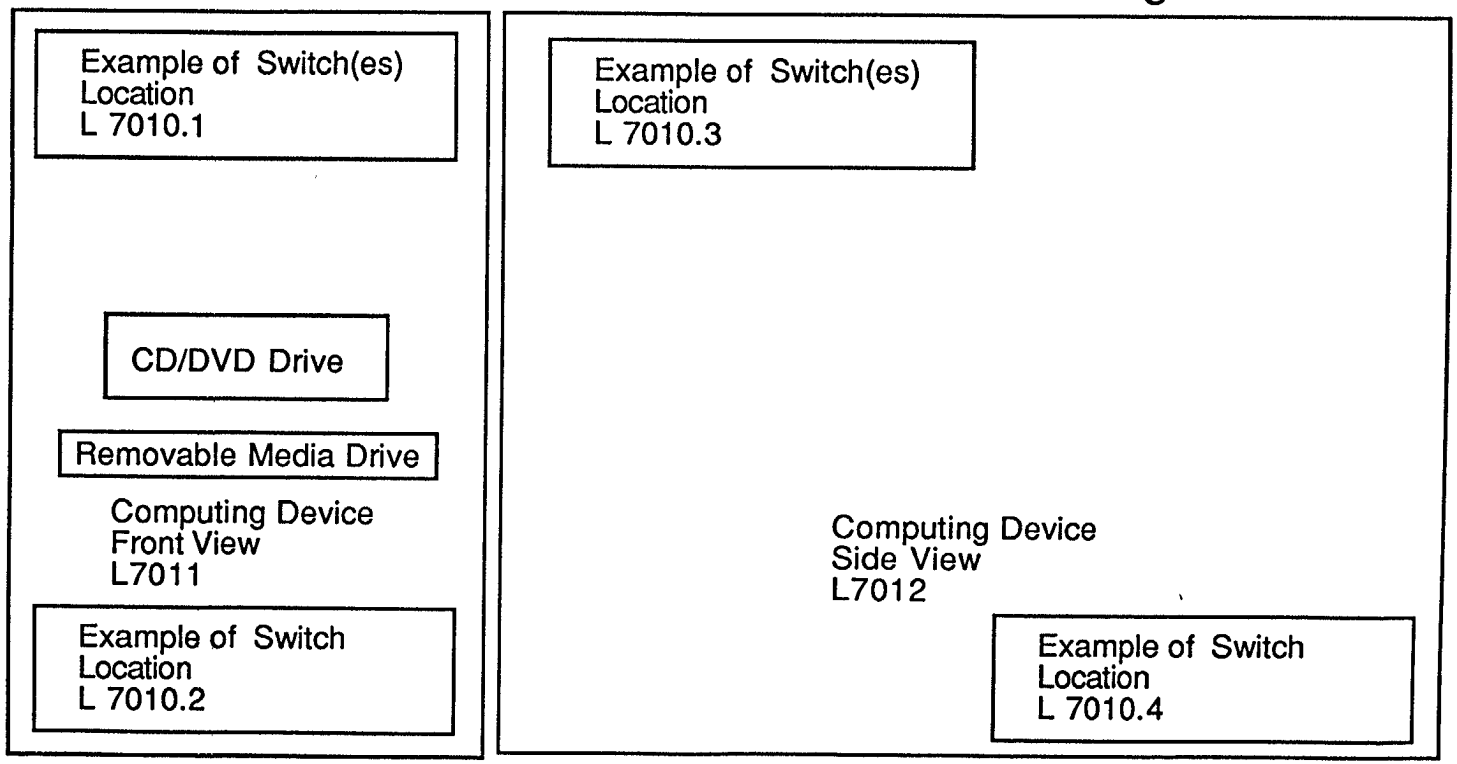
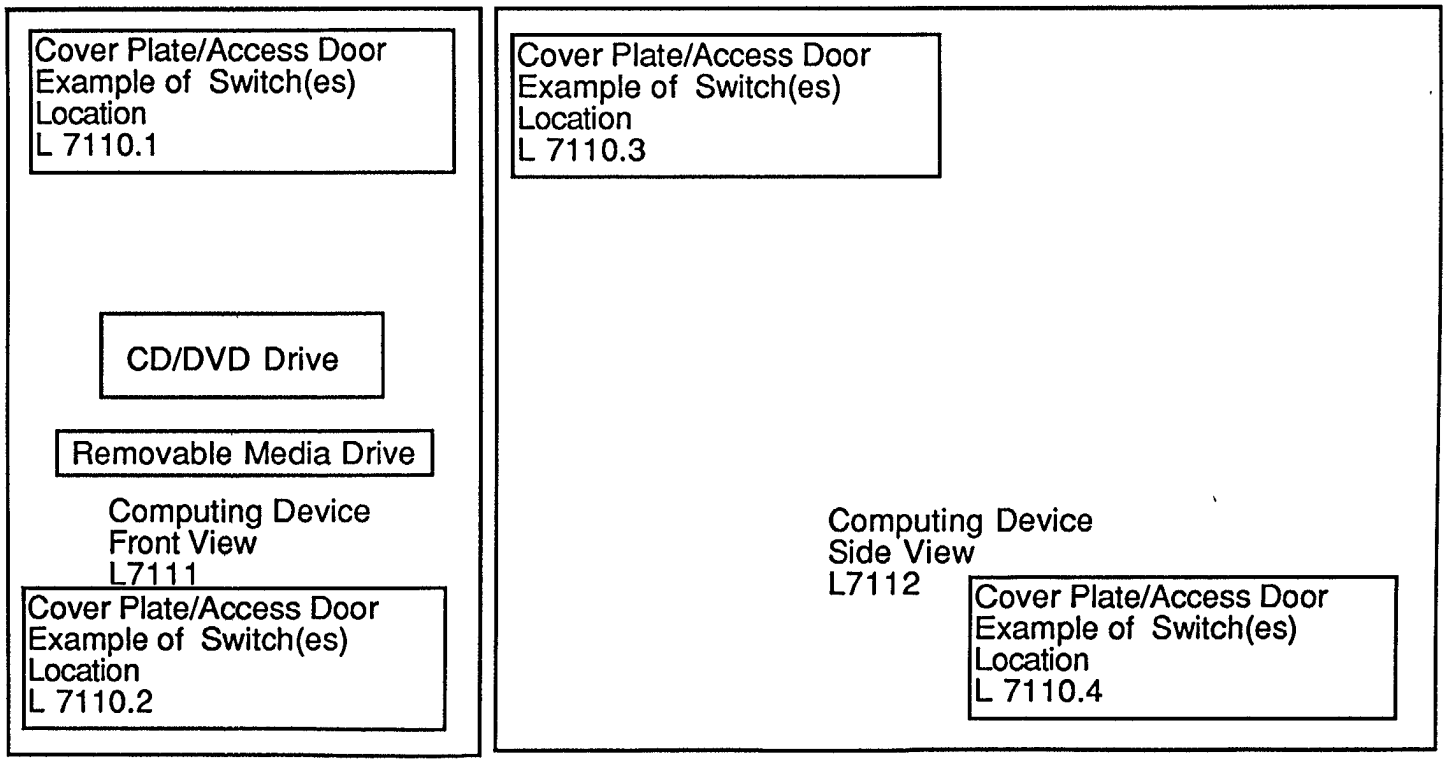
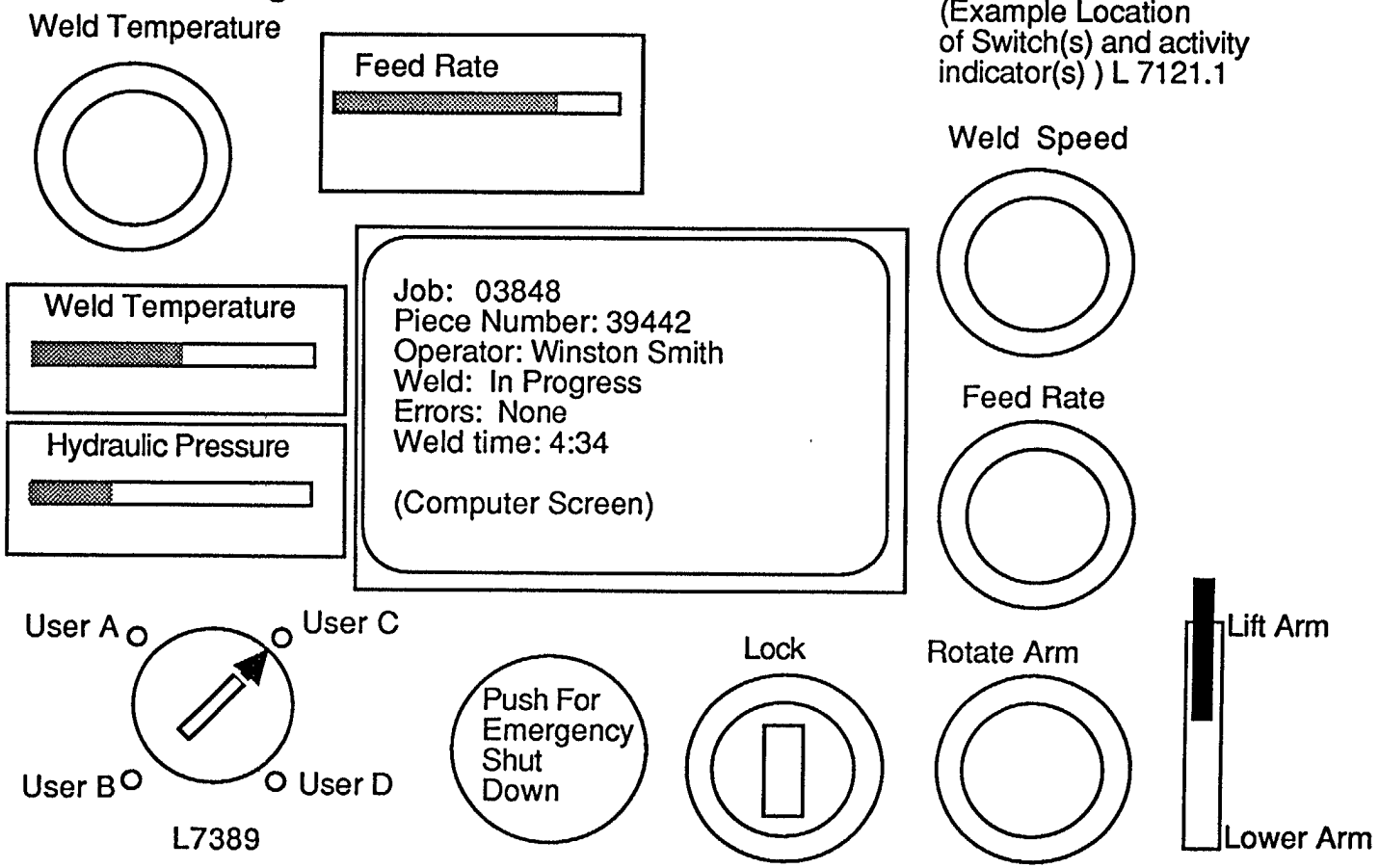

Example of Switch(es) Location L 7010.1
CD/DVD Drive
Removable Media Drive
Computing Device Front View L7011
Example of Switch Location L 7010.2
Example of Switch(es) Location L 7010.3
Computing Device Side View L7012
Example of Switch Location L 7010.4

Figure L 71


Cover Plate/Access Door
Example of Switch(es)
Location
L 7110.1
CD/DVD Drive
Removable Media Drive
Computing Device
Front View
L7111
Cover Plate/Access Door
Example of Switch(es)
Location
L 7110.2
Cover Plate/Access Door
Example of Switch(es)
Location
L 7110.3
Computing Device
Side View
L7112
Cover Plate/Access Door
Example of Switch(es)
Location
L 7110.4

20T720 989h/00T

Figure L 72MU Sheet 24 of 29

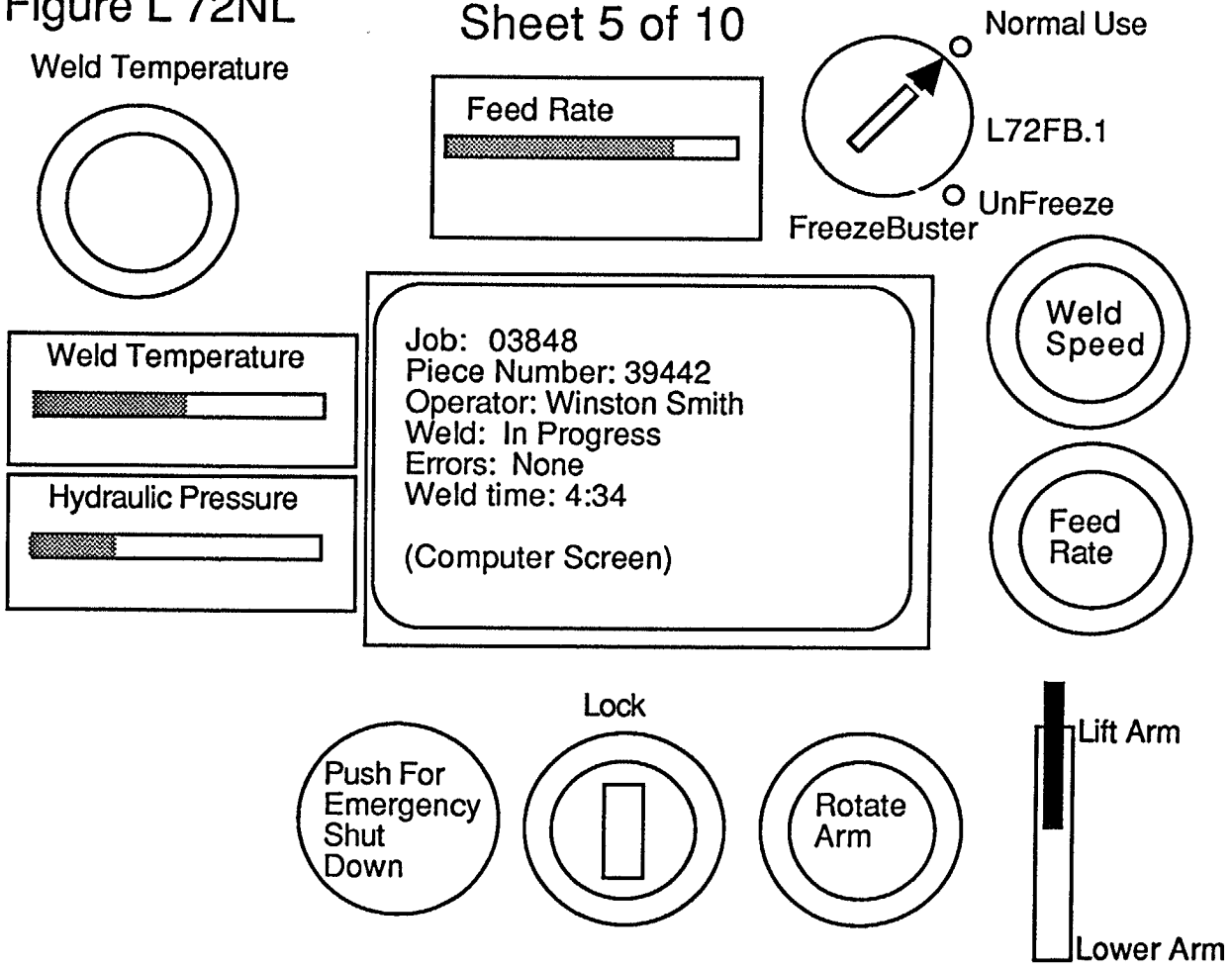


10071686.021102

20T120 989h200T

Figure L 72NL

Sheet 5 of 10

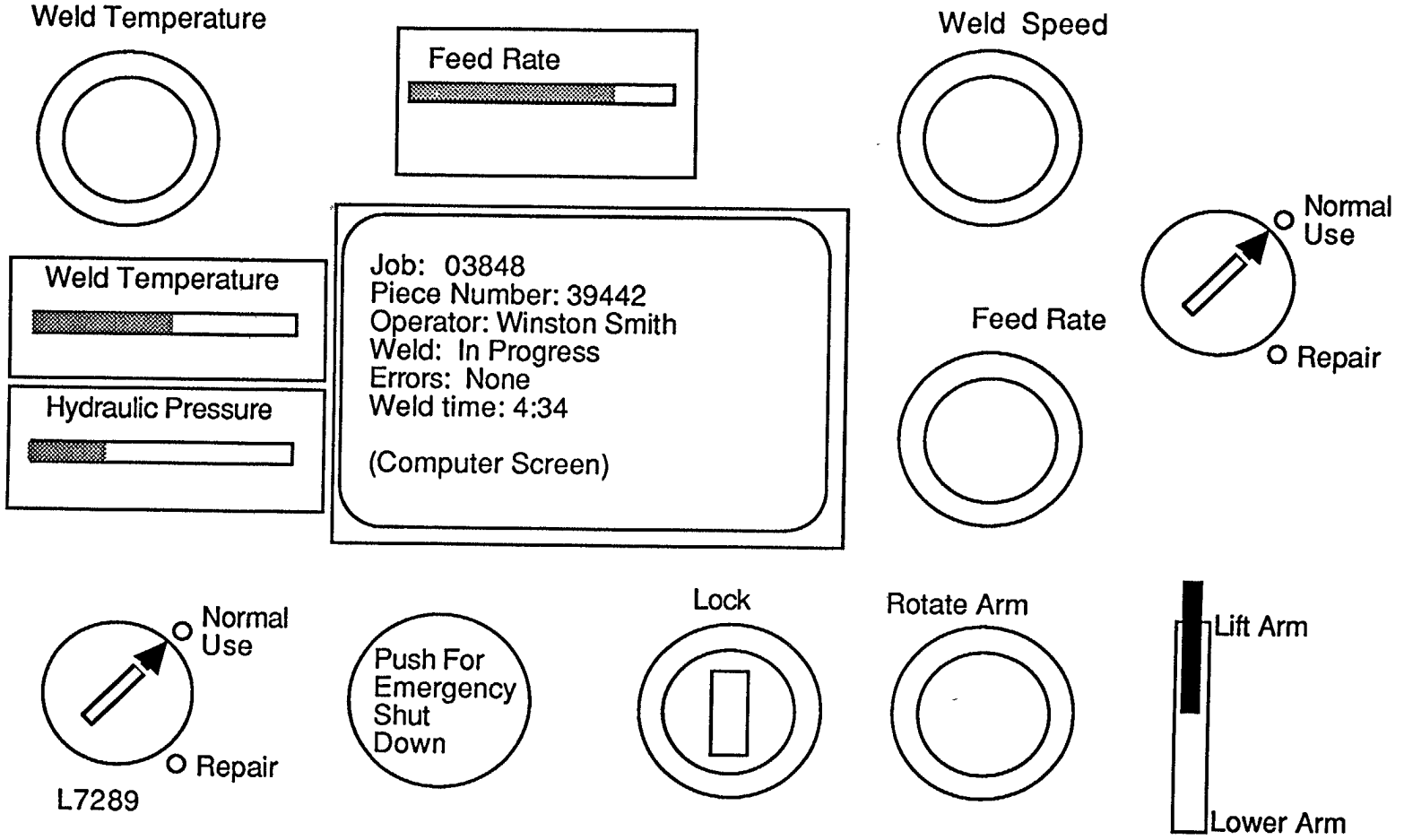


10274686.021102

20T120 989h2001

Remote SWITCH
(Example Location of Switch(s)
and activity indicator(s)) L 7121.1

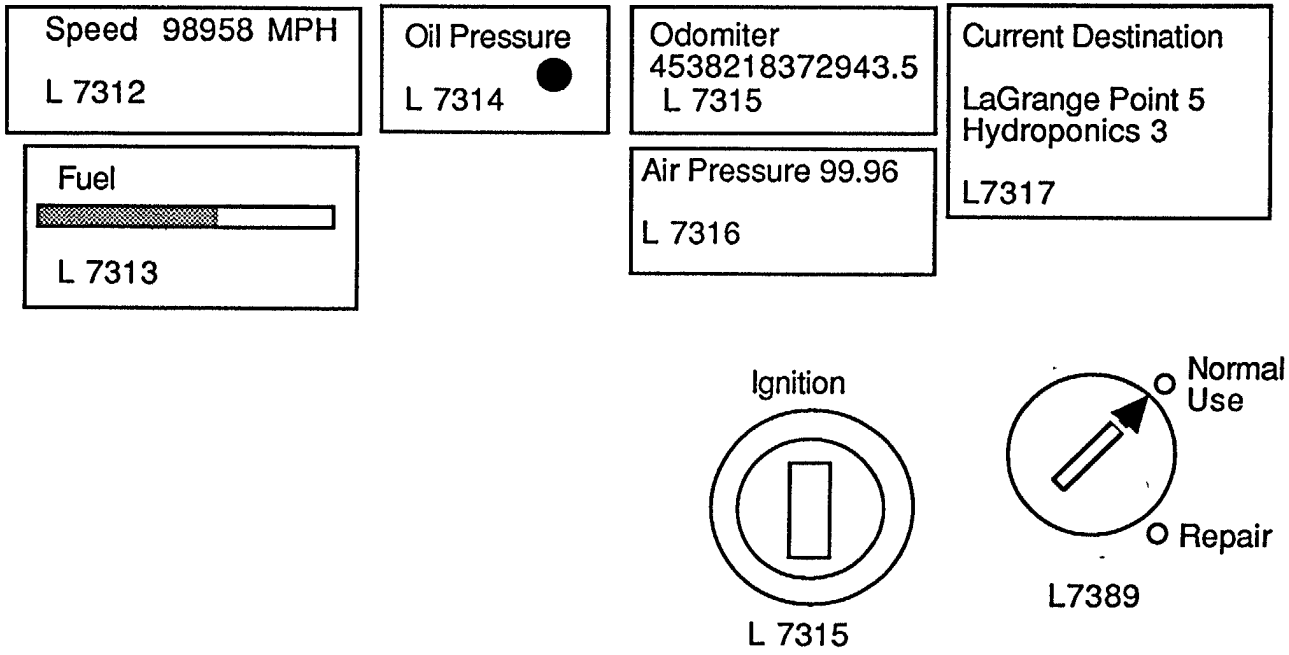
Figure L 72S



L0071506 .02 L102

20T120" 989h/20T

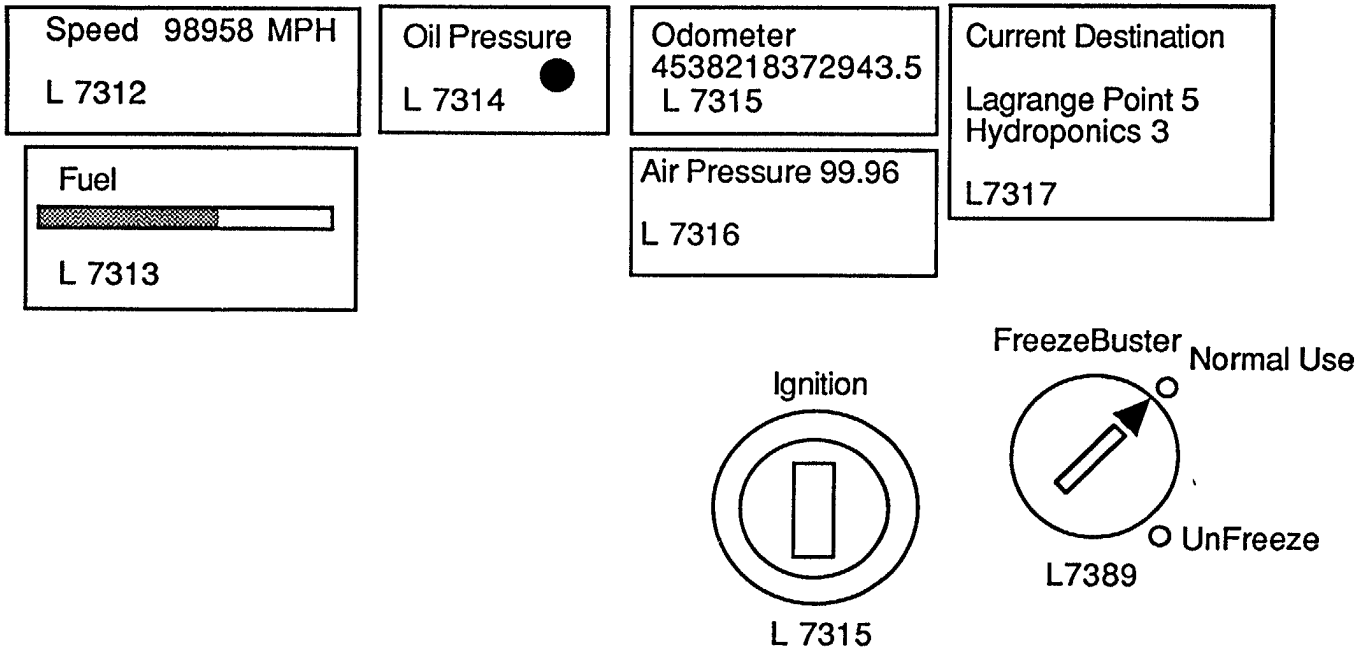
Figure L 73



10074636.021102

20T20" 989h200F

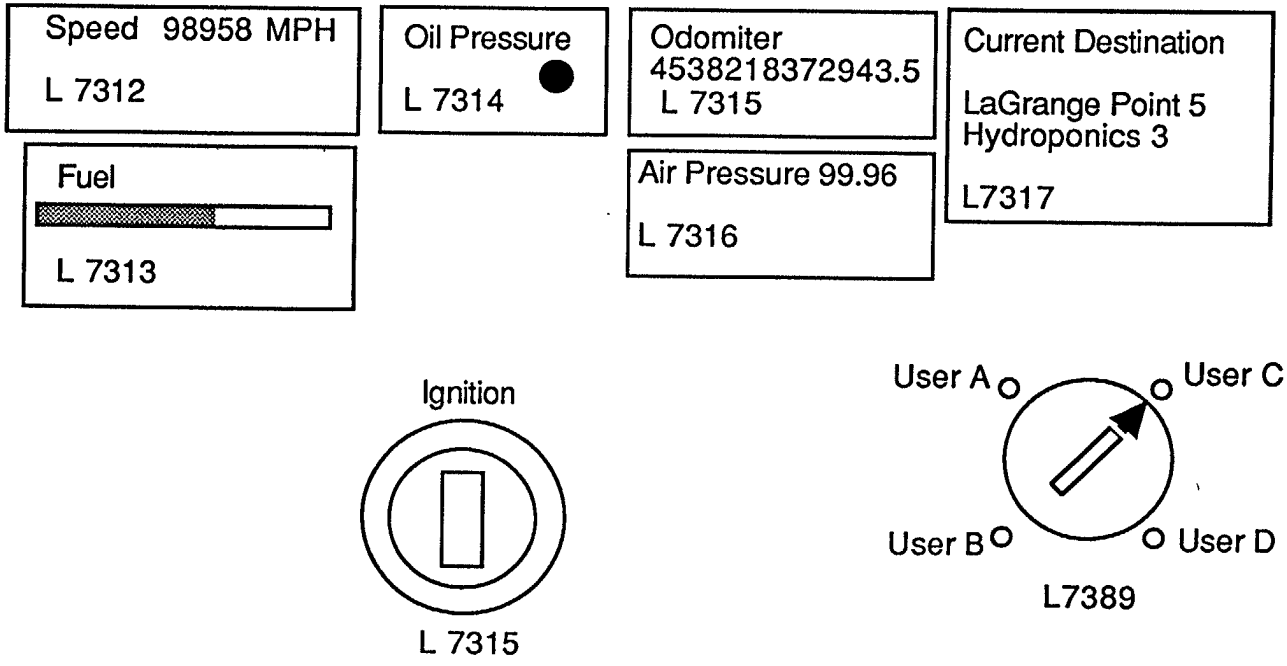
Figure L 73FB



10074666.021102

20T120 989h200T

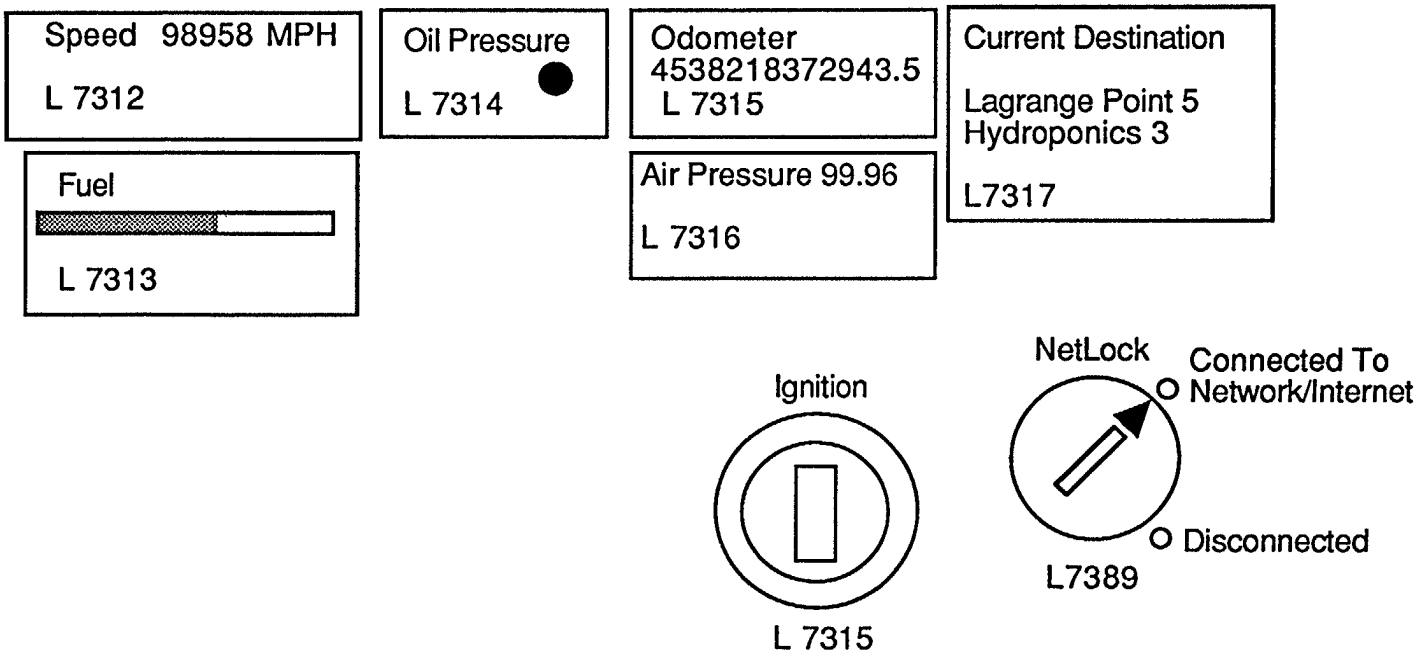
Figure L 73MU Sheet 25 of 29



10071686 .0211132

20120 9894001

Figure L 73NL



10074696.021102

Figure L 74 Robotic Device Sheet 15 of 15

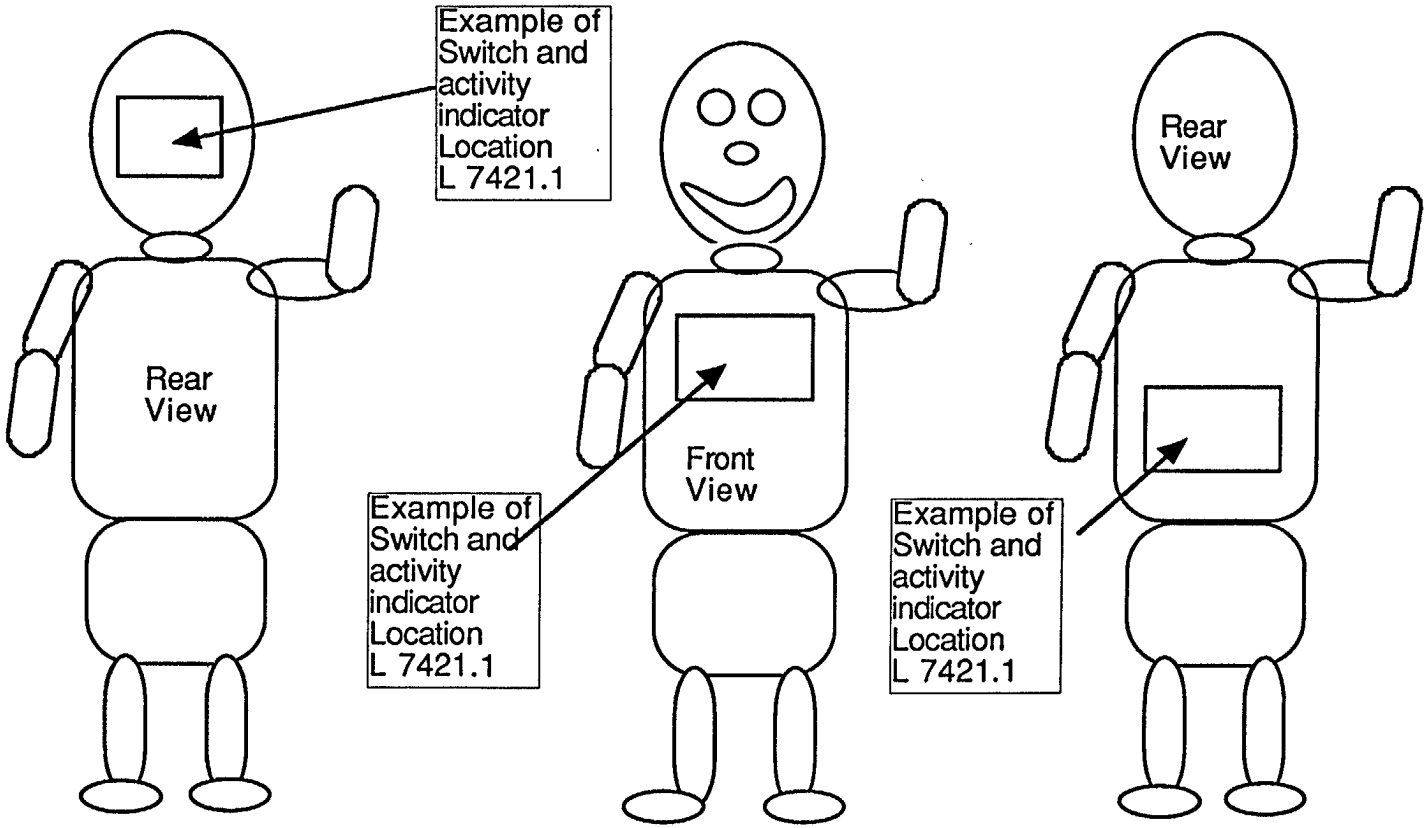


Figure L 75 Sheet 27 of 29

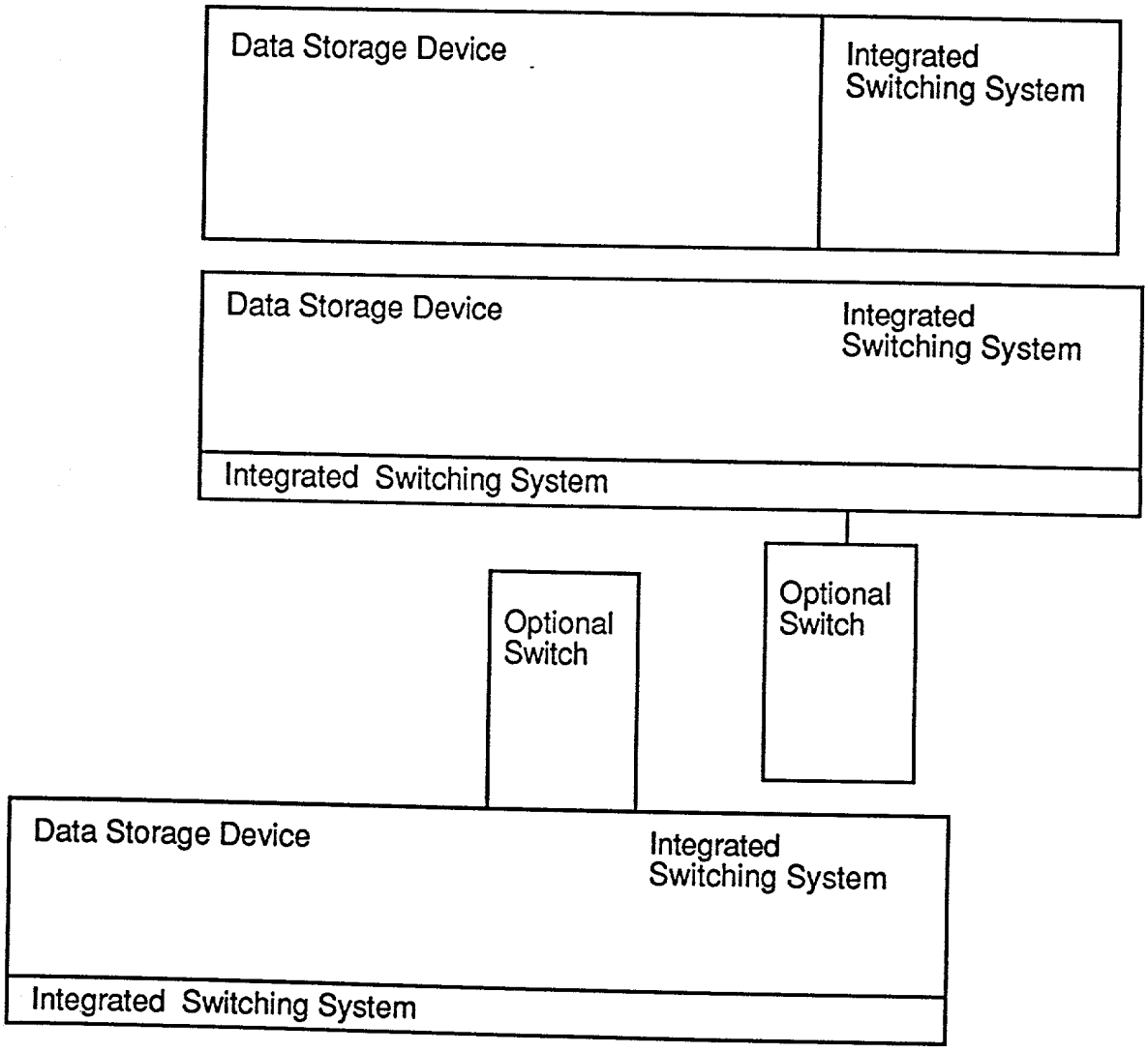
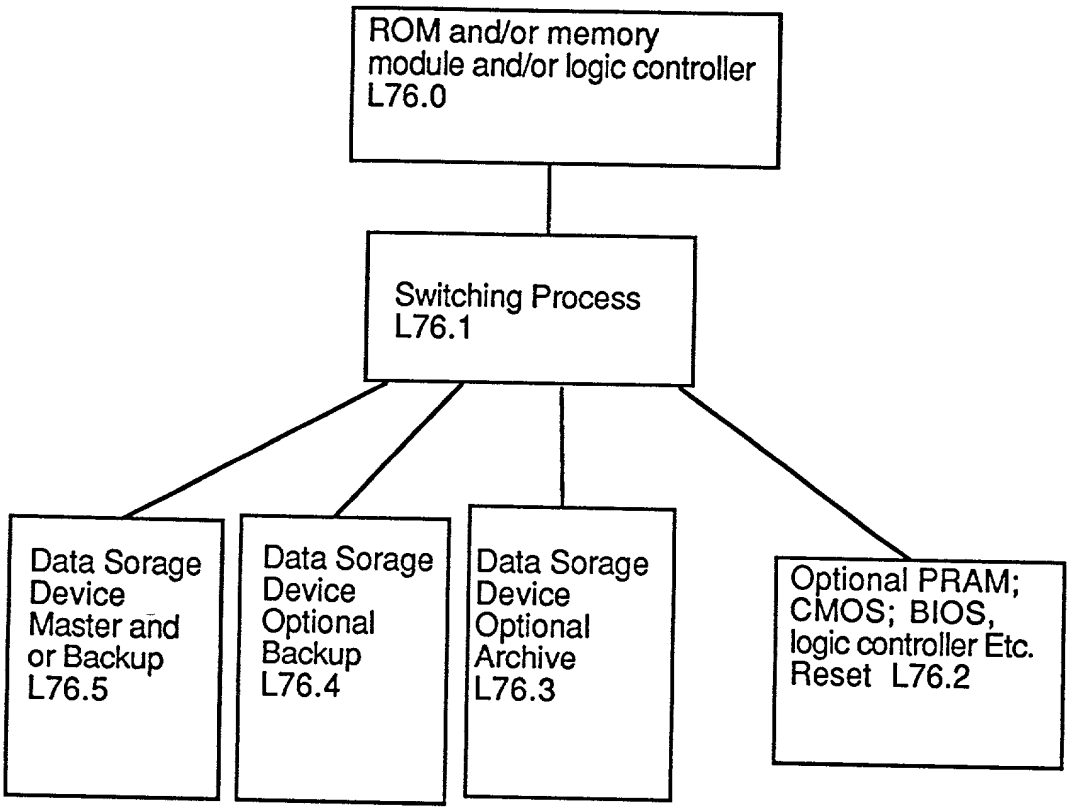


Figure L76 ROM



Document Page 1004/1004

Figure L76.1 Another ROM

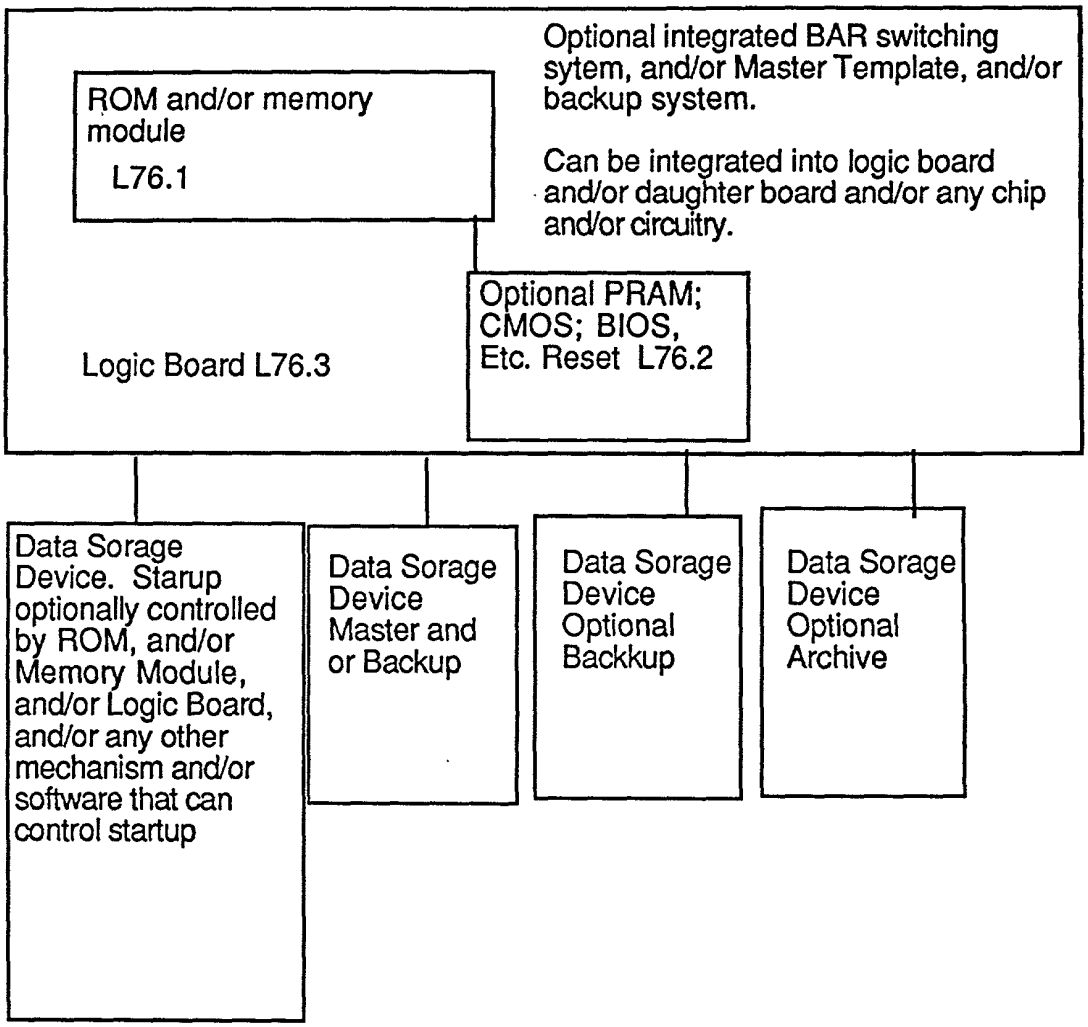


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Figure L76CD

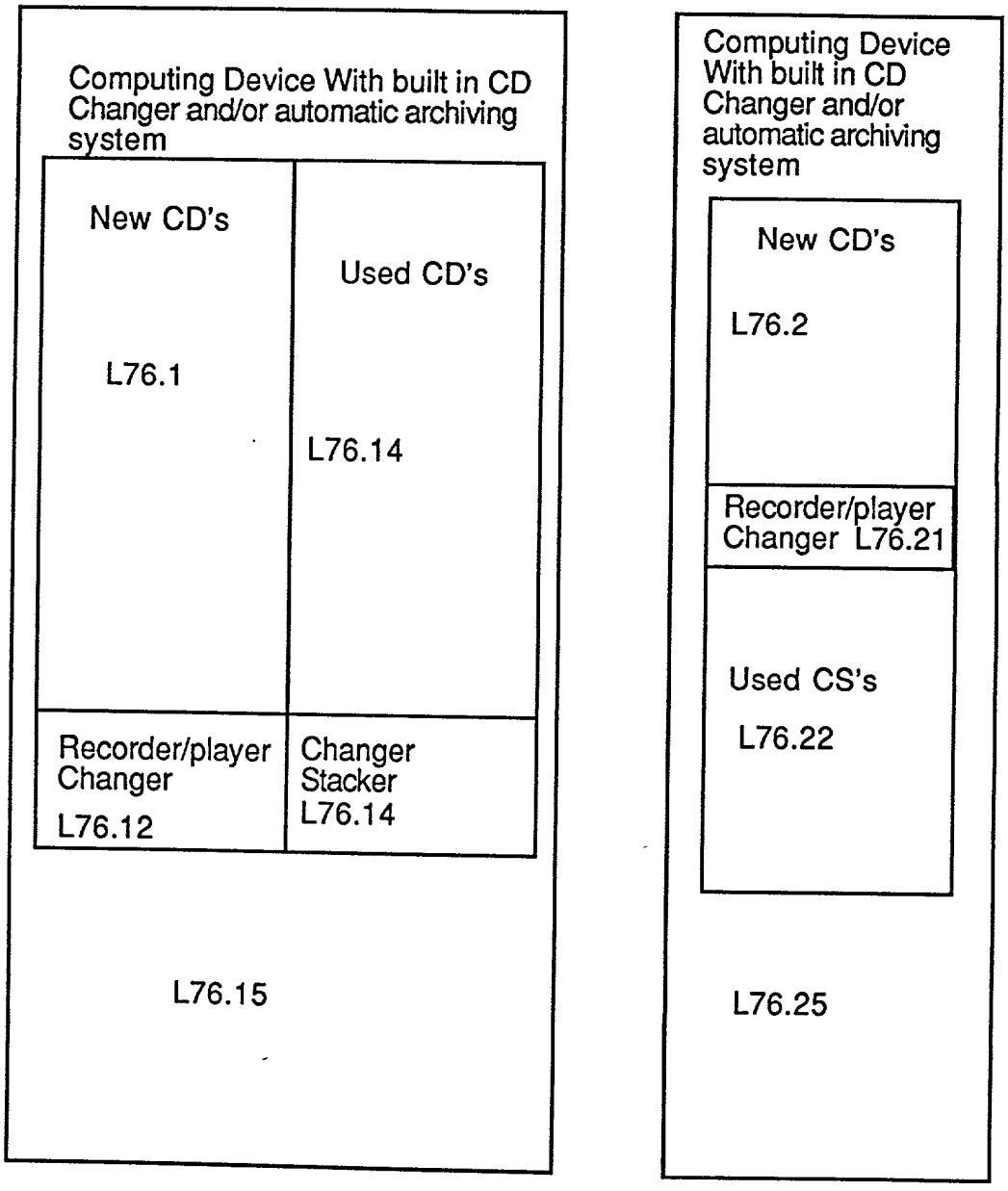


Figure L81 Sheet 28 of 29

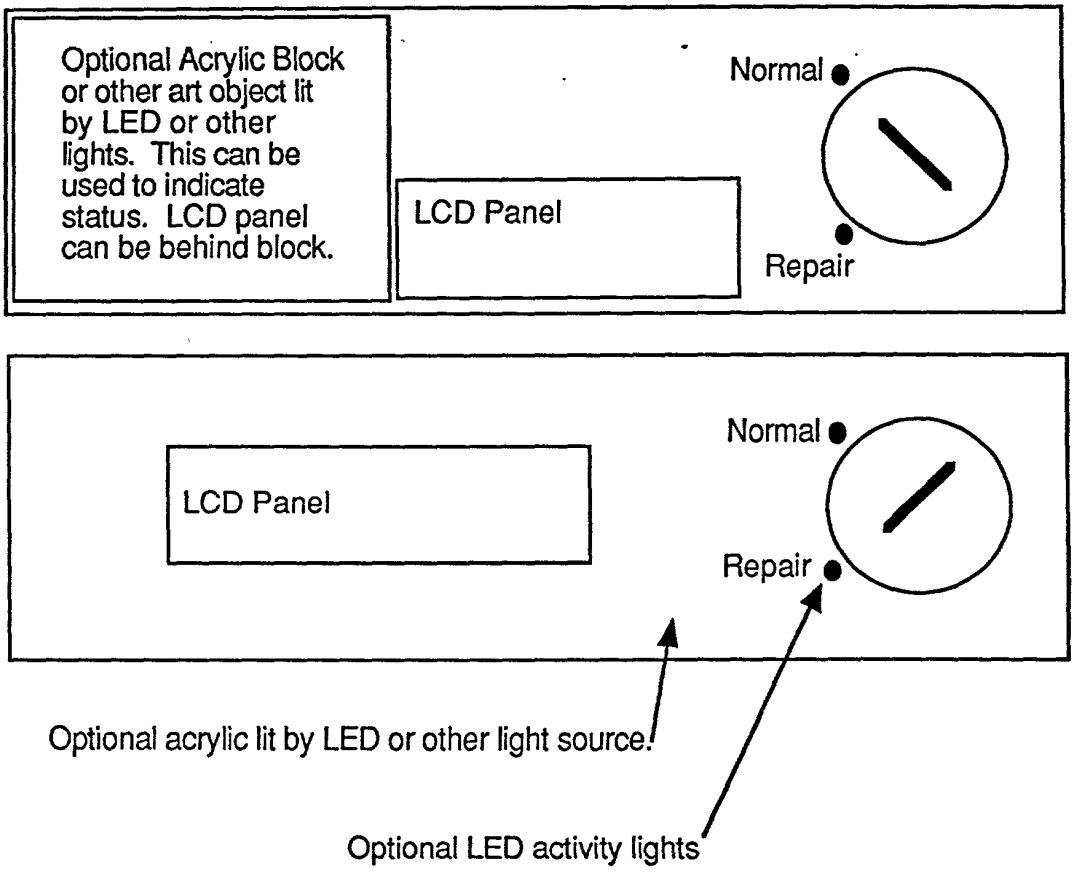


Figure L81FB Sheet 28 of 29

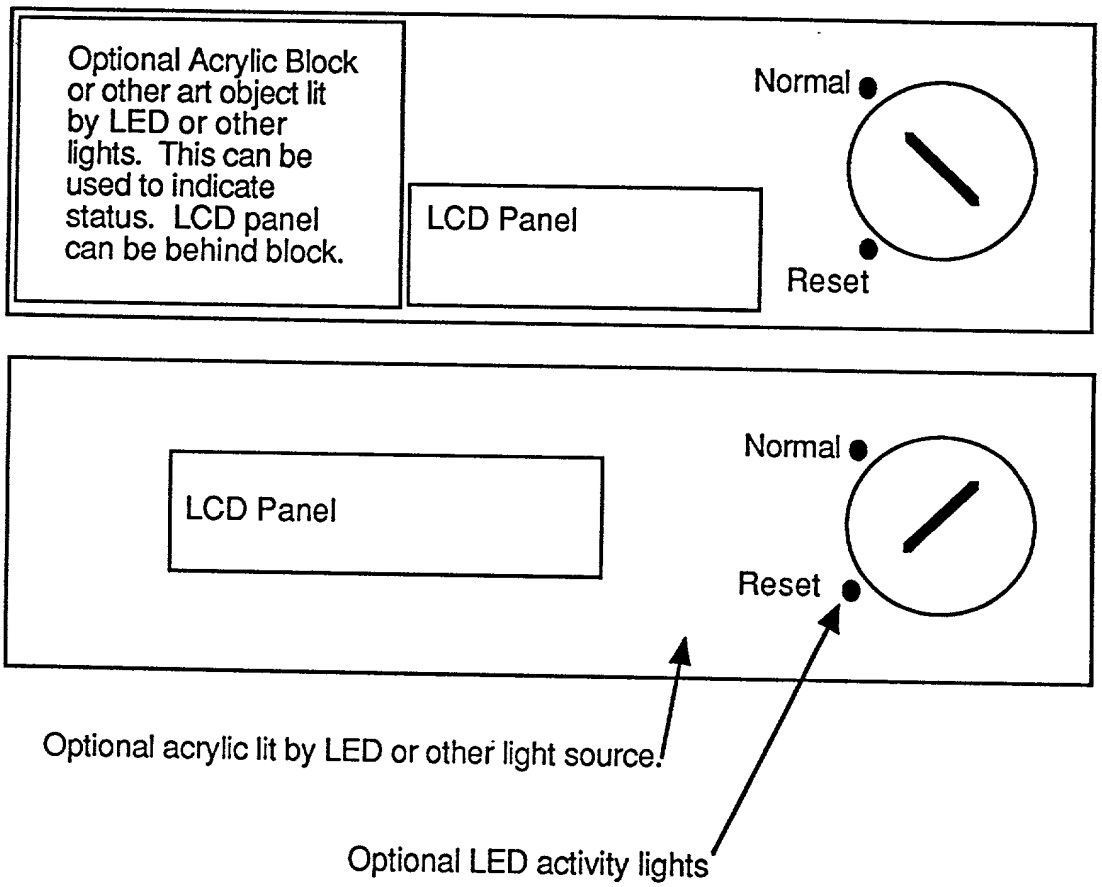


Figure L81MU Sheet 28 of 29

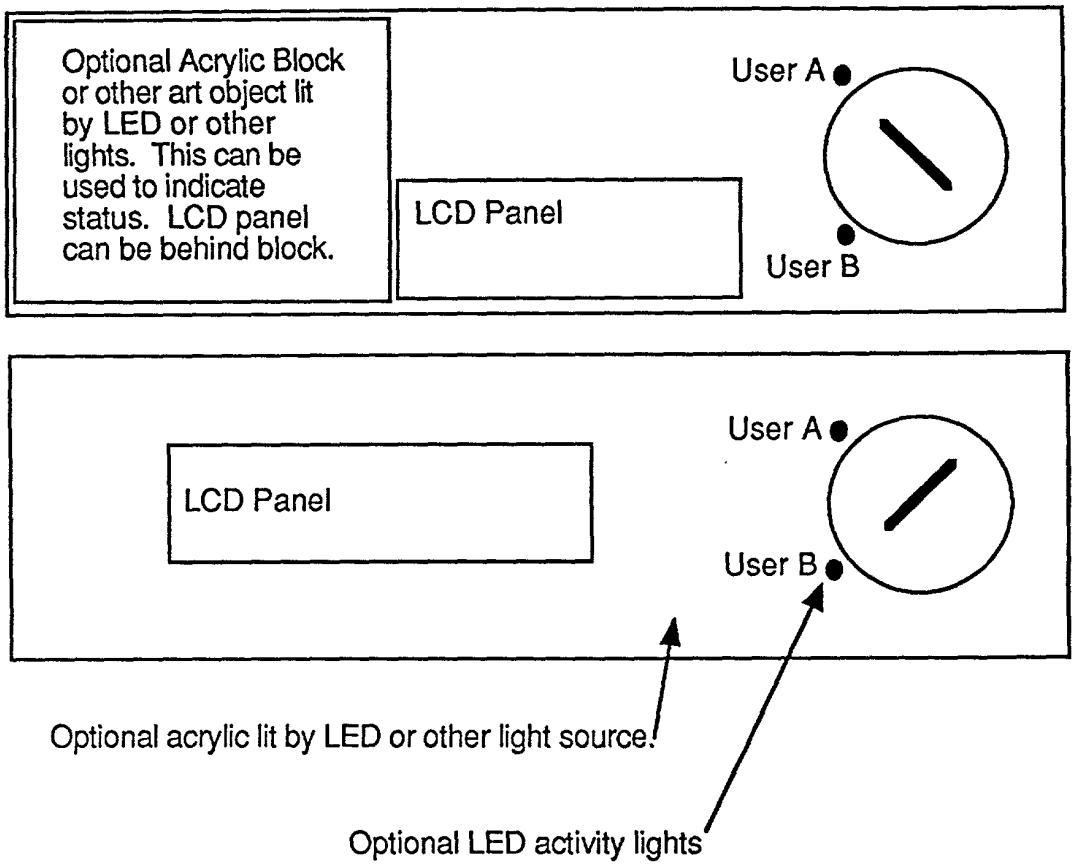


Figure L81NL Sheet 28 of 29

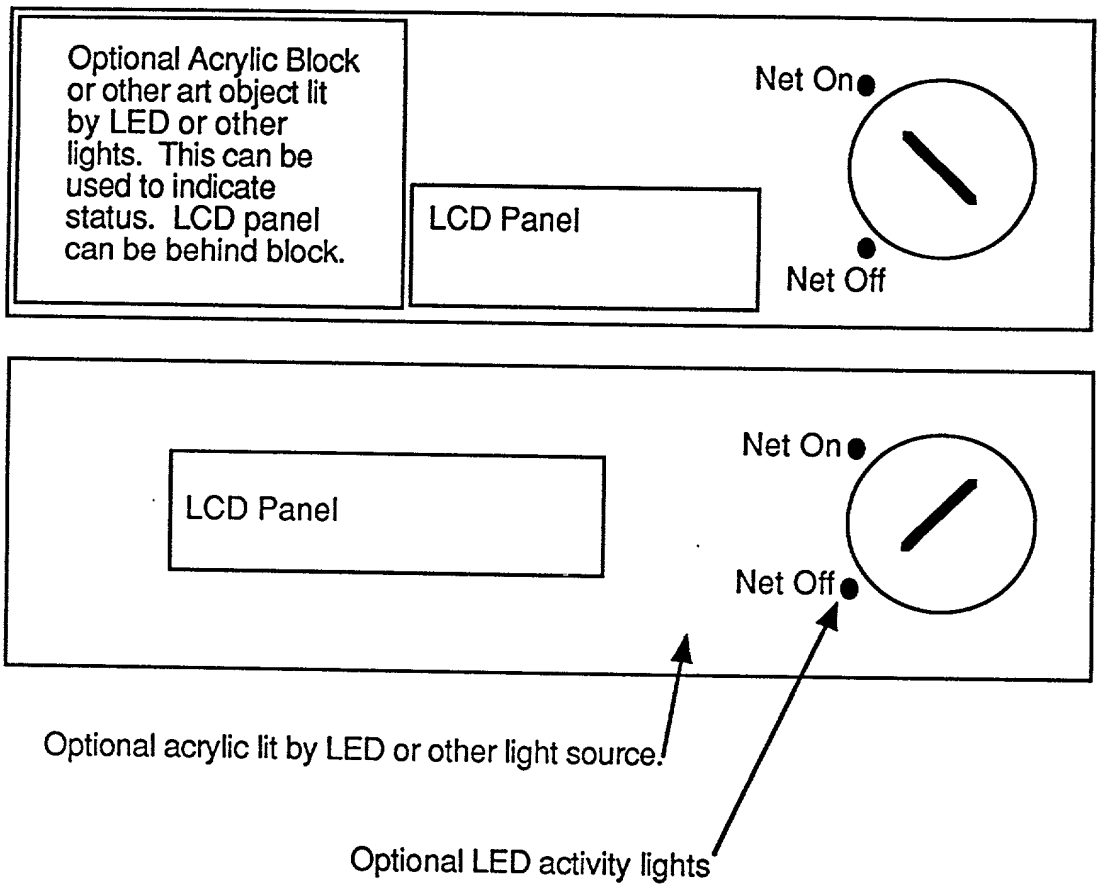
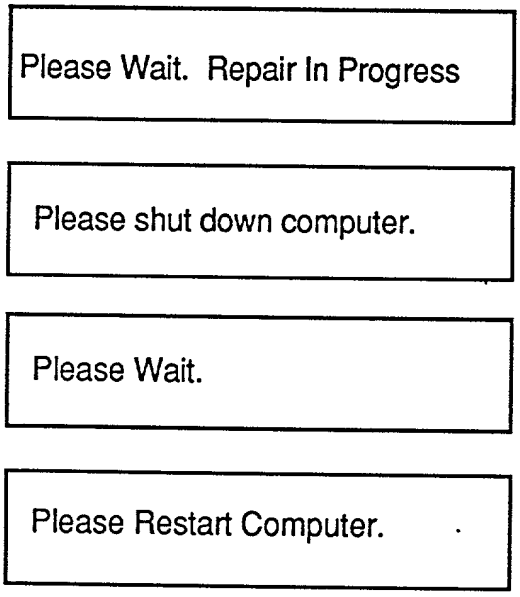


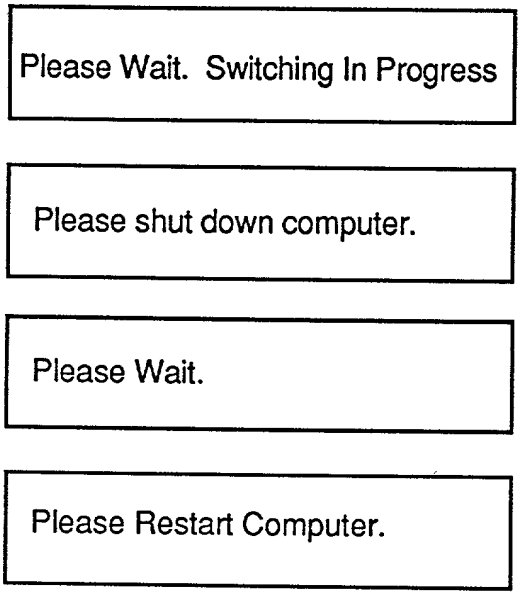
Figure L83 Examples of optional LCD screen dialog.



In addition to using an LCD screen, or in Lieu of using an LCD screen, dialog can be written directly to monitor, and/or communicated by other means of communication such as speech.

Serial No. 09/964,007

Figure L83MU Examples of optional LCD screen dialog.



In addition to using an LCD screen, or in Lieu of using an LCD screen, dialog can be written directly to monitor, and/or communicated by other means of communication such as speech.

0011-100-9994-1000

Figure L84

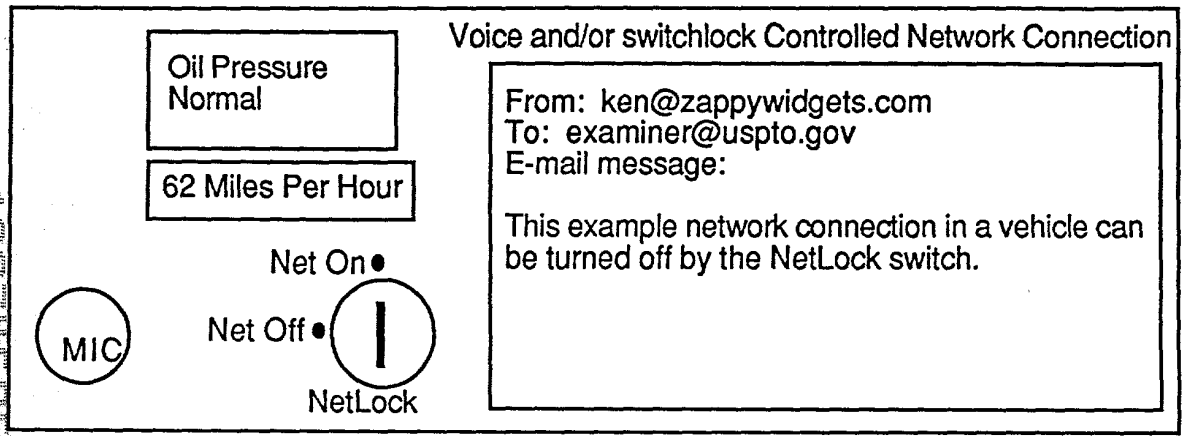


Exhibit 2004, page 9 of 9

APPENDIX "B"

On-the-Fly Repair Of A Computer

This continuation-in-part claims priority to pending application Serial No. 09/862,898, filed on May 21, 2001, with Atty. Docket No. A-70543/RMA/LM.

U.S. Patent Application No. 09/862,898 is incorporated herein by reference.

The following invention provides an apparatus and method of supporting the backup and recovery of a computing device. The computing device will typically include both a user computing environment and a supporting environment which enhances the stability and functionality of the user computing environment.

Processes

In one embodiment, a plurality of computing processes may be utilized to enable the On-the-Fly invention. Here, individual computing processes may monitor, track, predict the stability, backup, restore, or recover attributes within the user computing environment. The attributes may be software specific, data specific, operating system specific, or any combination. Utilization of the plurality of computing processes can facilitate the normal operation of the user computing environment. In one embodiment the user computing environment may be stabilized without user intervention such as requiring the user to shut-down, restart, logging off, logging on, or terminating applications. In one embodiment the supporting environment may have a capability interacting with the user computing environment. In one embodiment the supporting environment may be capable of initiating or causing the user computing environment to shut-down, restart, logging off, logging on, or terminating applications.

Different computing systems

In one embodiment the user computing environment and the supporting environment function in different computing systems. The two computing systems may reside in a common box. The user computing system may consist of data storage devices, RAM, processor, video card, and other attributes known in the art to facilitate a computing system. The supporting computing system may consist of a master template data storage device, RAM, processor, and other attributes known in the art to facilitate a computing system. In one embodiment, the data storage devices may be linked as needed to perform repairs. Such as, the need to copy data from the support environment to the user environment.

Snap-Shot of data

In one embodiment, the present invention takes a snap-shot of the user computing environment. This snap-shot may subsequently be utilized to restore, analyze, or enhance the stability of the user environment. The snap-shot may include a stable image of the operating system, software

applications, or user data. The snap-shot may contain an idealized or stable version of a disk drive utilized by the user environment, or a subset of the disk drive such as an individual partition. The snap-shot may also include an idealized version or image of the user system RAM, user system disk drive, user system partition image, memory of the video card, or any other memory stored or utilized in the user computing environment. These snapshots may be stored in the associated support environment data storage device.

Monitoring

The supporting environment may monitor the user environment. The monitoring may include monitoring of processes running or enabled within the user environment. The monitoring may include monitoring both the utilization of the data storage device, data contained on the data storage device, and other aspect necessary for the normal operation of the user environment. This monitoring may facilitate identifying undesired changes, potential problems and also potential solutions. The supporting system may detect a freeze or other undesirable change within the user environment.

Recovery

When an undesirable change is detected in the user environment, the supporting environment may attempt to recover or restore or repair the user environment. The supporting system may be capable of re-enabling the user environment in a number of ways, such as resetting the keyboard in the event the keyboard locks the communication of keystrokes to the user environment. Further recovery of the user environment may be supported by reset connections such as describe by "Freezebuster", reset and clear devices as needed, replace defective software components as needed, and/or switch hardware components and/or devices as needed. The supporting environment and or supporting system may copy all or part of the data from one or more of the idealized snapshots mentioned above. These snapshots may be copied into their respective devices and/or locations.

Application Configuration

Another embodiment supports an ability to run two or more different programs at the same time on one computing system where the data and applications may be isolated from one another but may share output and/or input devices. In one embodiment, the applications may be isolated by executing the applications in a separate address space. The applications and data may be further isolated by utilizing two separated data storage devices. In order to safely send a command from one isolated data storage device to the other isolated data storage device the following may be utilized. In one embodiment, when an icon on the desktop icon is clicked the following may occur. The icon may execute a command that would launch a specific application on the other isolated data storage device. This may be accomplished by a shared ASIC that sends the command to the other isolated data storage device.

Another embodiment involves isolation of data with merged display. In this embodiment

two user environments can be separated for the purposed of isolating data. For the Anti-Hacker System: A hard drive that does not contain "sensitive" data could be isolated and attached to a network. A second hard drive, may or may not be attached to the other hard drive (in any way), could be utilized for "sensitive" user data, but have no exposure to the network because it is "isolated" by a means of switching. The video signals associated with the data coming from these two hard drives could then be "merged" onto the same screen. In other words, all of the computing would be happening within isolated "secure zones" within a single computer but would not appear so to the user. Another example: the anti-virus system could use this method to isolate potentially infectious data.

Application Output
Applications may have its output displayed on the same screen alongside and/or superimposed upon the same screen with other applications and data that were being "computed" separately. Both computing processes may be separated but may then be "merged" together on the screen, and/or overlaid one another on the same screen. In one embodiment, this may be achieved by using multiple video cards. This concept can be applied for example to the Repair System, Multi User, Anti-Hacker, anti-theft and Anti-Virus.

In another embodiment both the user computing environment and the supporting environment will reside on a single computer system. A snap-shot of the operational user environment will be taken. The snap-shot will be associated with the supporting environment. Processes associated with the supporting environment will monitor the activities and status of the user computing environment. The monitoring function will become aware of any degraded performance of the user computing environment, such as a system freeze up. The monitoring function notifies the supporting environment of any degraded performance. The supporting environment will perform any recovery action as necessary to recover or restore the user environment. Recovery may include utilizing the snap-shot to recover or restore the user environment. An entire user disk may be restored. A specific application or software package may be restored, or particular files.

What is claimed is:
1. A computer system that repairs itself on the fly.

Figure W65

DRAMUS used for switching computers/computing Hardware Separate "anti-virus" E-mail CPU with separate "non-Email CPU"

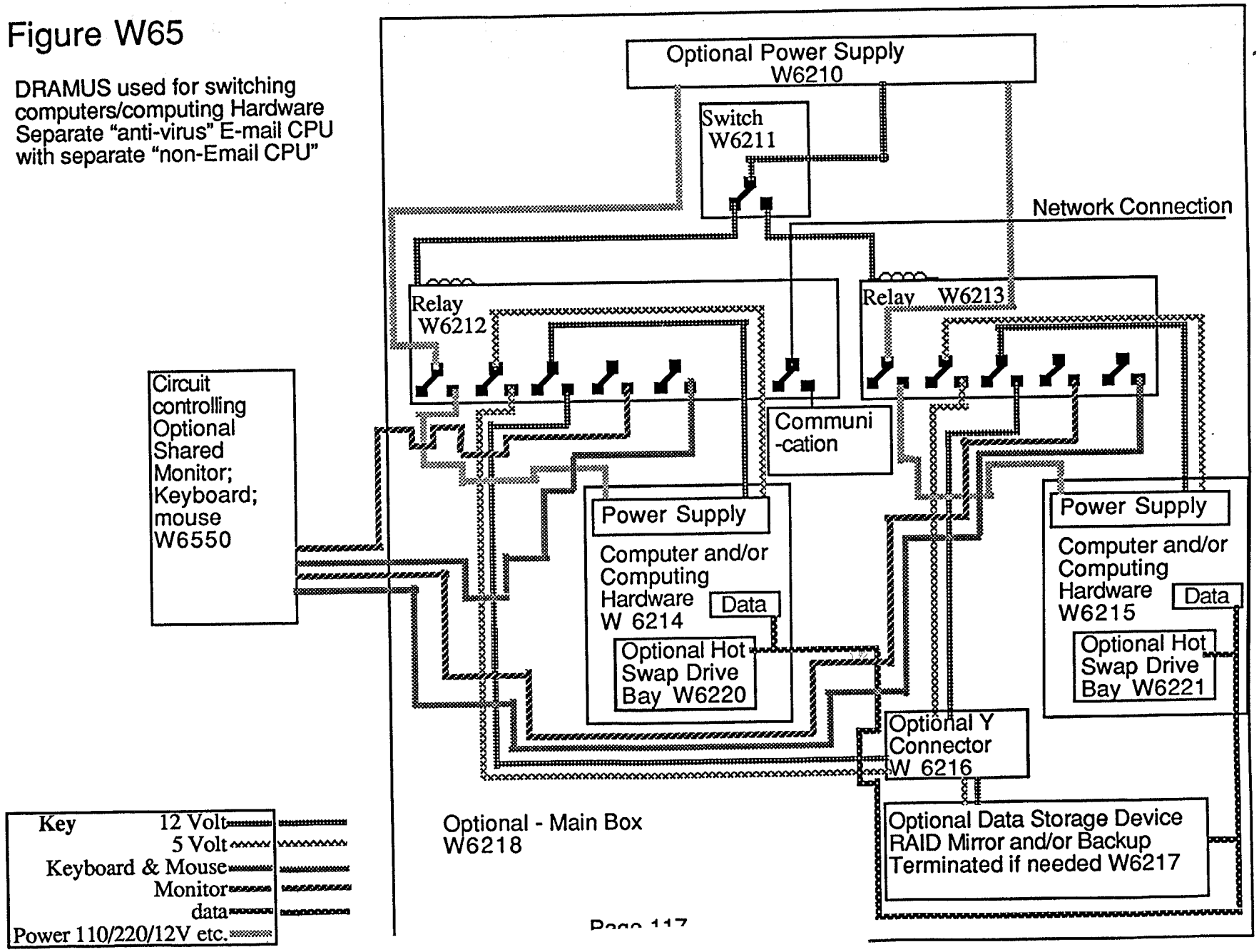
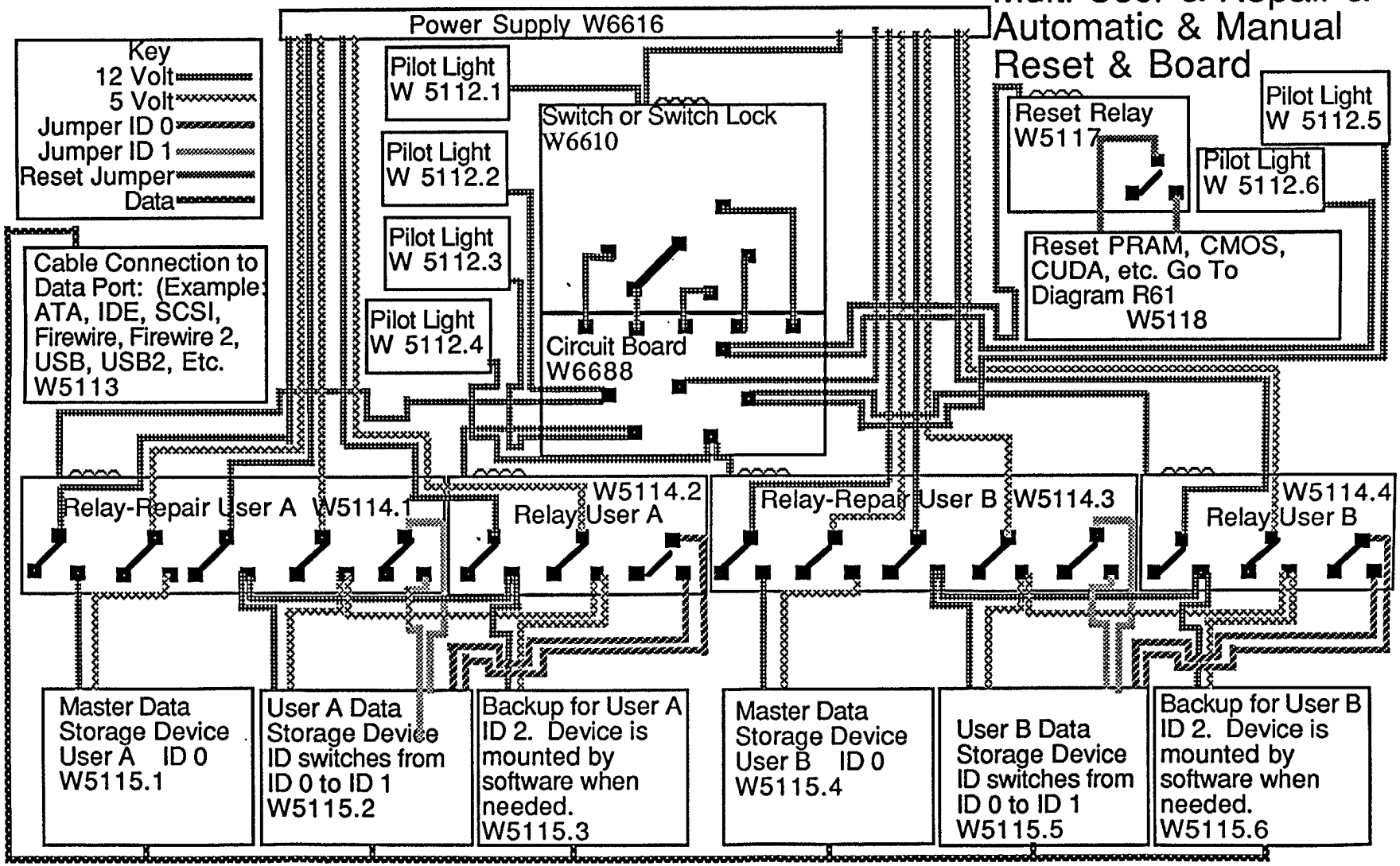


Figure W66
Multi-User & Repair & Automatic & Manual Reset & Board



Sheet of

Figure W67

DRAMUS used for switching computers/computing Hardware Separate "anti-virus" E-mail CPU with separate "non-Email CPU"

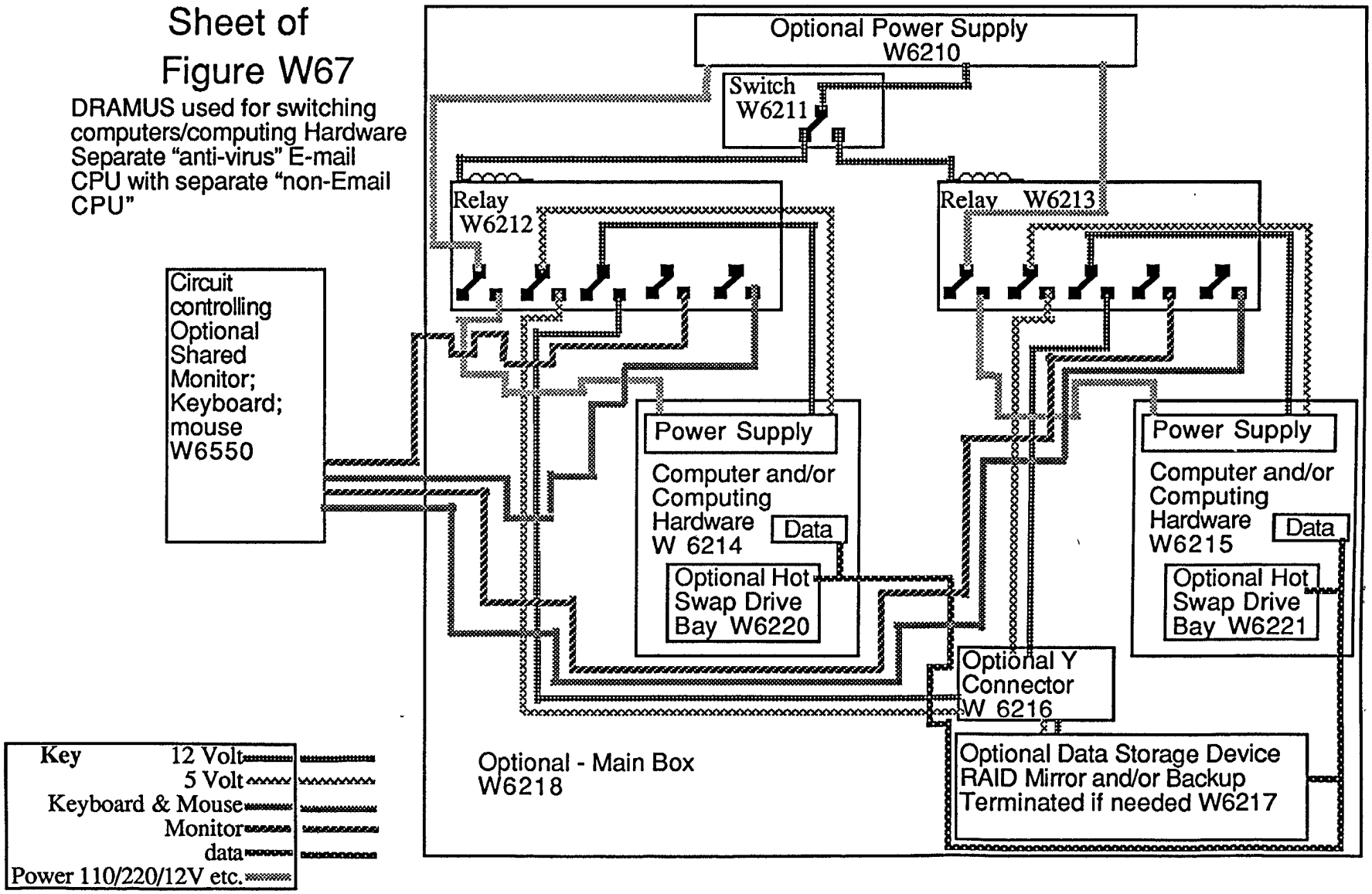


Figure W68

Sheet 19 of 29

Optional Circuit Board and Socket Assembly

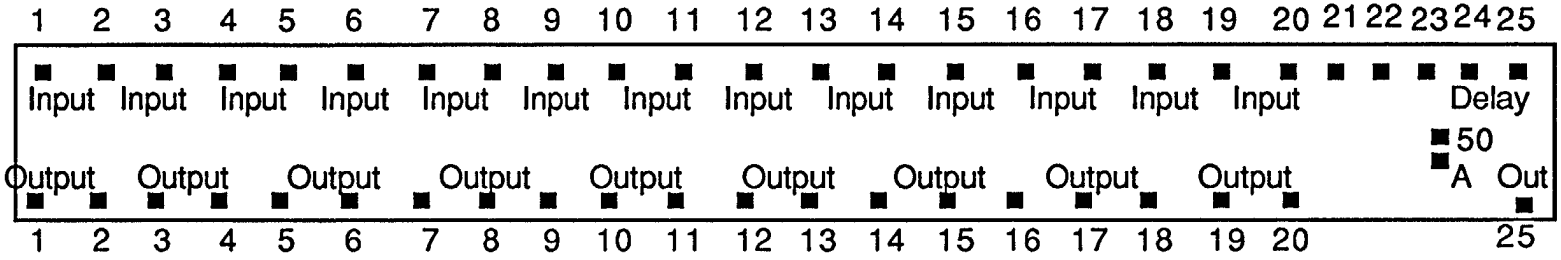
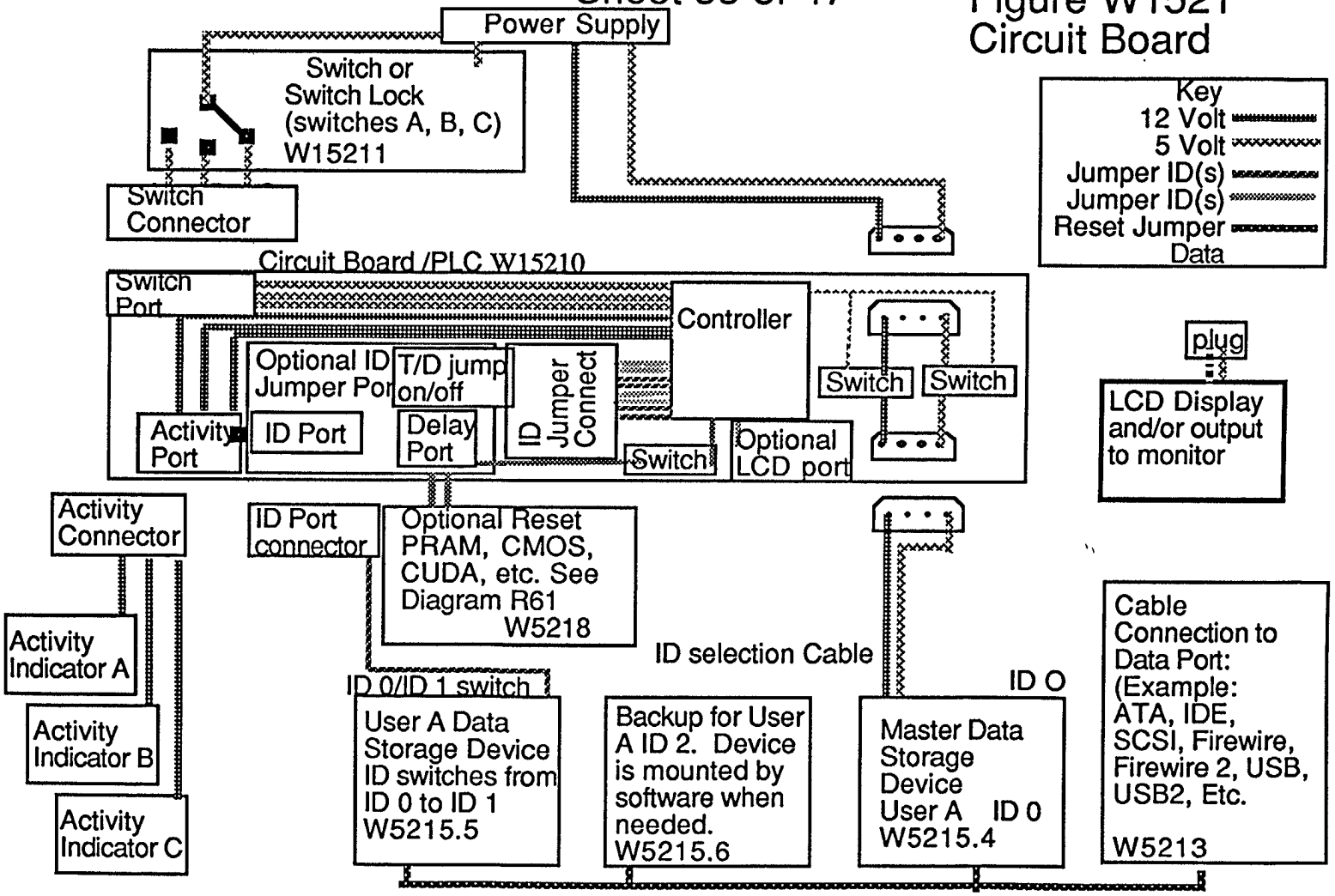
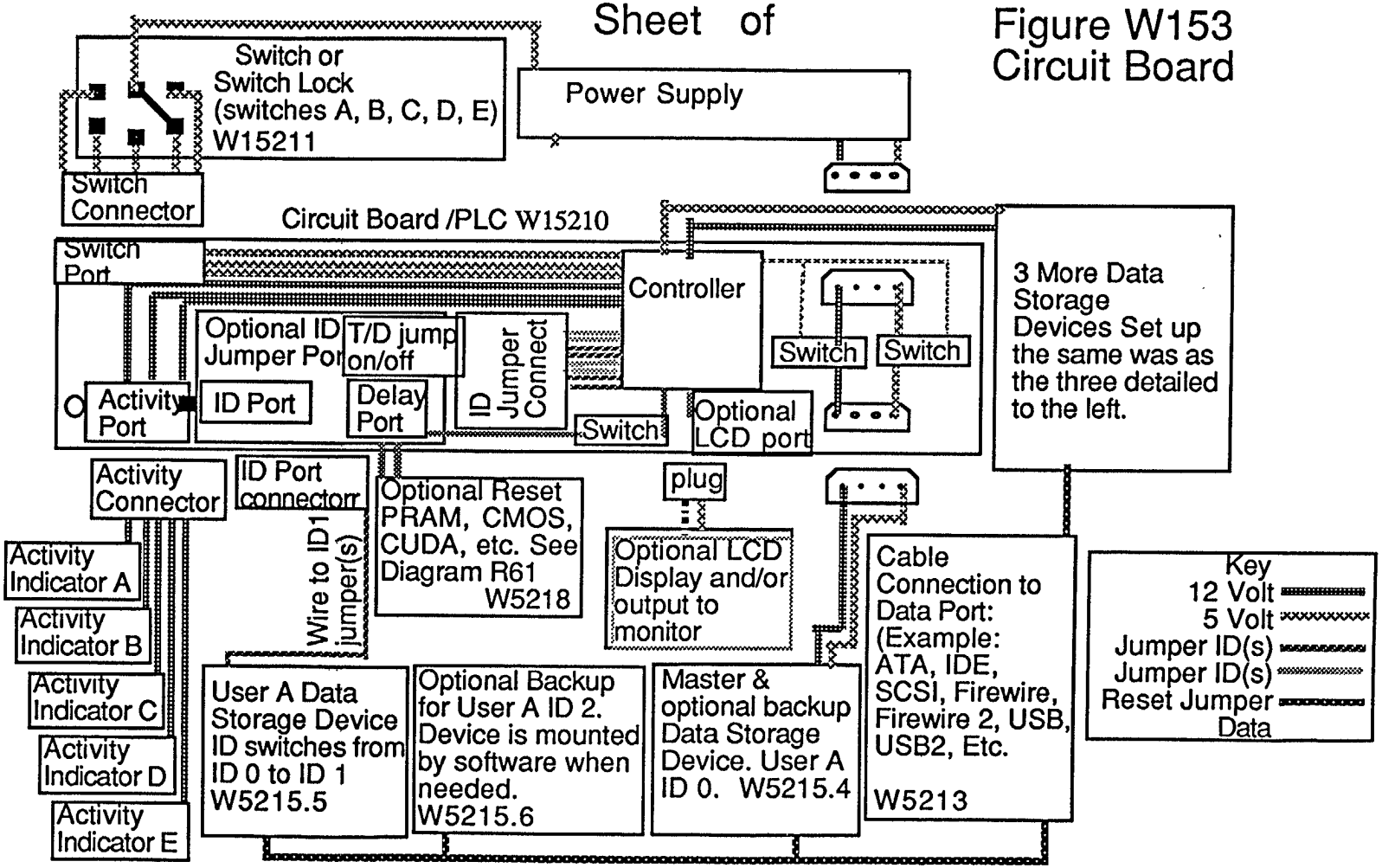

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25
Input Input Input

Figure W152T
Circuit Board



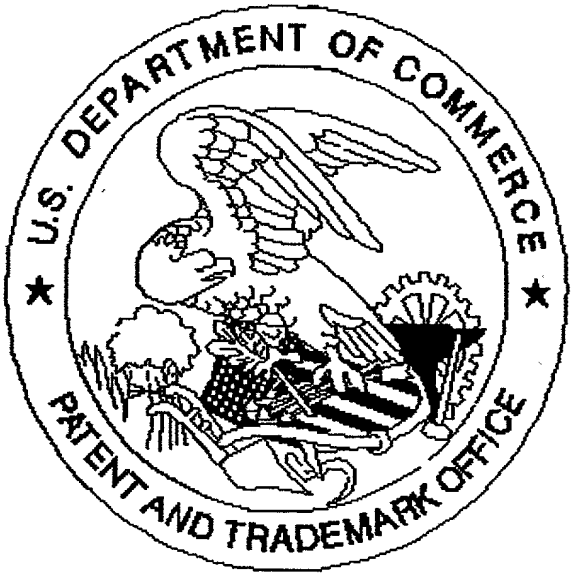
Sheet of

Figure W153
Circuit Board



United States Patent & Trademark Office

Office of Initial Patent Examination -- Scanning Division



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Application deficiencies found during scanning:

☐ Page(s)_____ of _____ were not present for scanning.
(Document title)

☐ Page(s)_____ of _____ were not present for scanning.
(Document title)

— only 3 pages of appendix B

☐ ***Scanned copy is best available.***